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## Pancreatic Disease

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### Introduction

The discussion to follow is based in part upon a representative selection of pertinent literature, and in part upon personal experience.\* Amongst those capable of evaluating the tests of pancreatic function, considerable differences of opinion exist as to the interpretation to be placed on the results obtained. This arises in our opinion from attempting to read into the procedures a quantitative significance which they could not be expected to possess. There are at present no methods of measuring pancreatic function and disease comparable to the liver function tests. The techniques are, relatively speaking, crude. They do not directly assess cellular damage, but only measure, directly or indirectly, enzyme concentrations of the external secretion. An analogous procedure would be a study of liver function by analyzing its external secretion, bile. Various workers have carried out careful series, particularly in the field of duodenal analysis, with the object of demonstrating clinically mild or transitory pancreatic disease. The most recent and most complete of these is that published in 1942 by Lagerlof, using the secretin test.<sup>11</sup> Dr. White, Professor of Biochemistry at this College, is studying the relative concentrations of lipase and trypsin in the secretion from the normal subject and from the subject with known pancreatic disease. The concentrations of these enzymes have been shown to bear a constant ratio to each other in most normal persons. Whether or not this approach will prove fruitful remains to be seen. In the meantime our own conclusions may be summarized as follows:

1. Only far advanced pancreatic disease can be diagnosed clinically without the aid of laboratory procedures.

\*The authors had the privilege of acting as assistants to Dr. F. D. White, Professor of Biochemistry at the University of Manitoba Medical College, during a research project on pancreatic function as revealed by quantitative analysis of duodenal contents.

2. Laboratory tests in mild pancreatic disease will generally be negative. Tests in moderate pancreatic disease will be equivocal but helpful. Advanced or acute pancreatic disease can be readily detected.

3. This lack of quantitative significance does not detract from their clinical usefulness. Advanced pancreatic disease of any form does not produce a clear-cut clinical picture, and in the differential diagnosis, laboratory work is essential.

4. Tests may, for clinical purposes, be considerably simplified, and are practical procedures for any reasonably well equipped hospital laboratory.

5. In this review a relatively complete list of available procedures is outlined. This does not indicate that they are of equal importance. In acute pancreatic disease the most valuable test is the serum amylase estimation. In chronic pancreatic disease the most valuable test is duodenal analysis.

### Laboratory Procedures

"These various methods of studying the function of the cells of the pancreas need much further use before final evaluation of their merit can be made." M. W. Comfort, 1940.<sup>4</sup>

### General Outline

The tests available at present may be classified as follows:

#### I

Tests of value in acute pancreatic disease.

1. Blood. Analysis for concentration pancreatic enzymes.

- (a) Serum amylase (and urinary amylase).
- (b) Serum lipase.

#### II

Tests of value in chronic pancreatic disease.

1. Faeces. Analysis for residual elements of the diet which have escaped pancreatic digestion.

- (a) Gross appearance.
- (b) Microscopic examination.
- (c) Chemical analysis.
  - (1) Fat.
  - (2) Nitrogen.

(3) Pancreatic enzymes.

(d) Weight.

2. Duodenal contents. Rate of secretion. Analysis for concentration of pancreatic enzymes and bicarbonate.

#### Methods of Enzyme Analysis

To discuss the laboratory methods of quantitative enzyme analysis would be out of place in a brief paper such as this. Our experience in the Biochemistry laboratory has been with research procedures designed to give as great accuracy as possible, whereas for clinical use rapid routine tests are necessary. These may be found in any textbook of clinical laboratory methods<sup>10, 12</sup> so that to reproduce them here would be superfluous.

The theory behind all these tests is quite simple. The solution containing the enzyme to be measured (i.e. serum or duodenal fluid) is diluted to a suitable degree, and a measured amount is pipetted into flasks containing a solution of the substrate. For trypsin analysis the substrate is generally casein or haemoglobin; for lipase, it is generally olive oil or tributyrin; for amylase it is starch. The flasks are kept in a constant temperature water-bath for a standard length of time. During this period the enzyme splits the substrate into amino-acids, fatty acids, or maltose as the case may be. At the end of the digestion period the reaction is stopped by adding some substance to inactivate the enzyme. The amount of enzyme is expressed in terms of units according to the amount of substrate it has broken down.<sup>14</sup>

#### Serum Enzyme Analysis

##### Theoretical Background

The pathology of acute pancreatic disease has been described in a previous article.<sup>15</sup> At that time the classical picture of "acute pancreatitis" was described, which is characterized by agonizing upper abdominal pain, immediate circulatory collapse, severe vomiting, rapidly developing peritonitis, and usually a fatal termination. In such a case the gland is almost totally destroyed. It was not pointed out, however, that sub-acute attacks may occur, in which a smaller portion of the gland is involved. The clinical symptoms are less severe, circulatory collapse is less severe or absent, peritonitis does not usually ensue. The prognosis is generally more favorable. Both the sub-acute and acute varieties of pancreatic necrosis present difficult diagnostic problems. The serum enzyme tests to be described are of great value in such cases.

As before described,<sup>15</sup> the acinar cells of the pancreas are supported by an alveolar network containing the capillary bed of the organ. Transfer of materials from the capillaries to the acinar cells occurs by way of the extra-cellular interstitial fluid. A certain quantity of the enzymic products of these cells diffuses in reverse direction back

into the blood stream. In this way a fairly constant blood level of amylase and lipase is maintained; whether or not trypsin occurs among other proteolytic enzymes in the serum has not been determined. It is generally supposed that acute and sub-acute pancreatic disease the disruption of the normal anatomy and physiology of the gland<sup>15</sup> liberates enzymic products which are taken up by the blood stream. In this way there occurs a measurable rise in the amylase and lipase units per cc. of serum. As the acute process subsides, and the disorganized gland lapses into

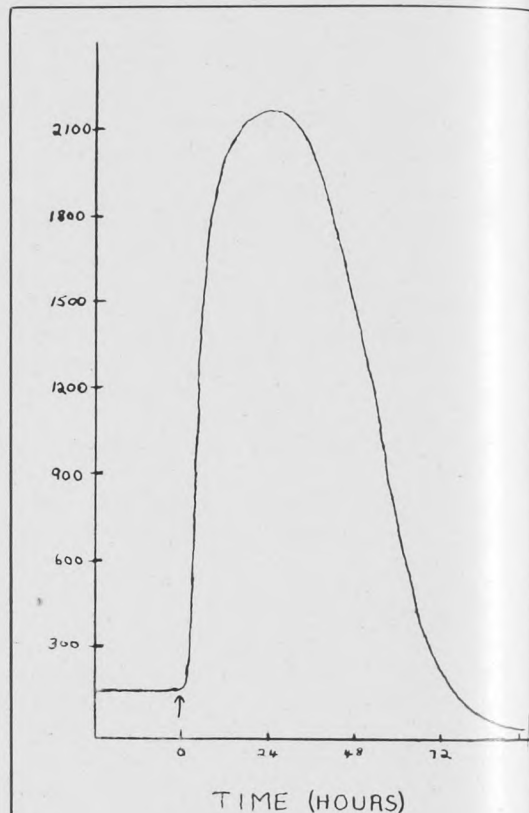


Figure 1. The explosive rise and fall of serum amylase levels following an attack of acute pancreatic necrosis. The arrow represents the onset of the attack. The values are shown as Somogyi units. This graph illustrates that estimation must be done early in the course of the disease.

state of subnormal function the enzyme concentrations rapidly drop to normal or subnormal levels.

This rise in serum enzyme concentrations provides the diagnostic feature of acute and sub-acute varieties of pancreatic disease. Where there is reason to suspect this diagnosis, the tests should be carried out as quickly as possible. Owing to the condition of the patient studies on duodenal fluid or on faeces have no place here. (Of course when the patient survives the attack tests may be done to assess his remaining pancreatic function.)

Conversely, the concentration of serum enzymes in chronic pancreatic disease has no significance. They may be normal, elevated or depressed.

#### Serum Amylase

A method of analysis for serum amylase was first introduced by Wohlgemuth in 1908. The most commonly used method today is that of Somogyi, in which normal values are from 70 to 200 units.

The serum amylase level rises rapidly during the first two hours of the attack, and may reach 3,000 units per cc. during the first twenty-four hours. (Fig. 1). As the attack subsides it falls precipitously. During the course of the subsequent twenty-four to forty-eight hours it reaches normal or subnormal levels.<sup>3</sup>

To be of diagnostic significance, the serum must be taken early in the course of the attack. Inflammatory conditions in nearby organs may secondarily involve the pancreas, or may produce spasm of the sphincter of Oddi, and thereby produce elevated values. But the explosive rise in blood amylase concentration described is diagnostic of acute pancreatic disease and the absence of such a rise points to an extra-pancreatic lesion. Of even more value is a series of estimations done every few hours showing the typical curve.

Pratt, in 1942, wrote:<sup>18</sup> "The importance of diastase estimations in the diagnosis of acute pancreatic disease cannot be over-emphasized. At the present time, well informed surgeons do not operate in a known case of acute pancreatic necrosis; hence the importance of recognizing the disease before operation is undertaken. The clinical signs are so obscure that formerly in very few cases was the diagnosis made except on the operating table. As the diastase value may fall to normal by the second or third day, the importance of making the test as soon as the patient is first seen is obvious. . . . It is important to repeat the examination at least once every day if the first value obtained is moderately elevated. A rapid drop in the diastase value gives the first value obtained additional significance."

#### Urinary Amylase

Since amylase is excreted via the kidney, the amylase level of the urine follows that of the blood. The serum estimation is probably preferable.

#### Serum Lipase

Rona and Pavlovic in 1922, and Cherry and Crandall in 1932, introduced methods of differentiating pancreatic lipase from the other esterases found in the serum.<sup>5</sup> These procedures are ingenious and interesting, but our impression is that they add nothing to that learned by the amylase test. The level of serum lipase is said to fall less rapidly than that of serum amylase following acute pancreatic disease.<sup>11</sup>

### Analysis of Faeces

#### Theoretical Background

It is not always appreciated that the substances ingested in the diet make up a very small part of the faecal material. In the normal individual only 5 to 3 per cent of the ingested fat and nitrogen passes through the alimentary tract without being absorbed; the remaining 95 per cent of the fats and proteins are split by the digestive enzymes into glycerol, fatty acids, and amino acids, and pass through the mucosa. During starvation faeces continue to be formed, and their composition does not vary materially from faeces passed after an ample diet. Indeed, if a portion of bowel is isolated from the rest of the intestinal tract, it will in the course of time become filled with faecal material which must of course be entirely endogenous. The normal faeces consist of undigestible food residues (such as cellulose), bacteria, leucocytes, desquamated epithelial cells, and material secreted in the bile and through the wall of the intestine. Fat may amount to 20 per cent of the dried weight. It is largely endogenous, for it differs chemically from the ordinary food fat, and resembles the blood lipids.<sup>2</sup>

Conditions of the alimentary canal in which either digestion or absorption is deficient will result in the appearance of dietary fat and nitrogen in the faeces in excess of the small amount which ordinarily escapes absorption. A deficiency of pancreatic secretion manifests itself by steatorrhoea, azotorrhoea, and creatorrhoea. Steatorrhoea refers to the passage of stools containing more than the normal 15 to 20 per cent of fat. The fat content may rise as high as 60 per cent of the total dry weight. Azotorrhoea refers to an excess of nitrogenous material in the stools. Creatorrhoea refers to the presence of undigested muscle fibres in which the transverse striations are visible.

**Steatorrhoea**—excessive fat in the faeces occurs in many conditions.<sup>13</sup> Deficient digestion of fat results from deficiency of pancreatic enzymes, or of bile. Deficient absorption may result from increased motility of the small intestine, obstruction of the intestinal lymphatics by tuberculosis or carcinoma, coeliac disease, gastro-colic fistula, infestation with parasites, or the excessive formation of insoluble soaps. Generally speaking if digestion is at fault, the excess fat will be largely neutral fat, whereas if absorption is deficient it will be largely split fat. Therefore a stool high in neutral fat and showing normal bile staining would make one suspicious of pancreatic deficiency.<sup>3, 7.</sup> This is not an invariable rule and should not be depended upon.<sup>17</sup>

**Azotorrhoea and Creatorrhoea**—the presence of excess nitrogen or undigested muscle fibres in the faeces is more significant than steatorrhoea, but besides a deficiency of pancreatic enzymes it may

be caused by any condition resulting in increased motility of the small intestine, which rushes the material through before digestion can take place.

Pratt has shown that the determination of nitrogen absorption is of greater diagnostic help than the determination of fat absorption. He makes the claim that deficiency of nitrogen absorption is almost always the result of pancreatic insufficiency. It remains normal in such conditions as obstructive jaundice and coeliac disease.<sup>3</sup>

Examination of the faeces is best carried out with the patient on a standard diet. For this reason Schmidt has described a test diet for use in intestinal studies.<sup>10, 12</sup> The diet is given for three days, with carmine (0.3 gm.) in a capsule at the beginning to identify the faeces. The morning after the diet is ended, charcoal (15 gm.) is given with a breakfast consisting entirely of milk. After the beginning of the test diet, the first stool coloured is saved, as well as all succeeding ones until the appearance of the first stool coloured with charcoal which is discarded.

The diet, as he described it, is as follows:

Mornings: 0.5 litre of milk with 50 gm. of zwieback (rusk).

Forenoons: Oatmeal gruel (40 gm. of rolled oats, 10 gm. of butter, 200 cc. of milk, 300 cc. of water, and one egg, salted to taste. Strained).

Noons: 125 gm. of finely chopped roast beef lightly broiled so that the interior remains uncooked. In addition, 250 cc. of potato puree (potato 190 gm., 100 cc. of milk, 10 gm. of butter, salted to taste).

Afternoons: as mornings.

Evenings: as forenoons.

This classical diet can be modified within reason. The important thing is that it contain uncooked muscle fibres and that its fat and nitrogen content be known.

The reader will have gathered that generally speaking analysis of faeces is a better guide to the integrity of the alimentary tract as a whole than of any one part of it.

The methods of examining the faeces in a case of suspected deficiency of the external pancreatic secretion are as follows:

#### Gross Appearance

Complete exclusion of the pancreatic juice from the intestine whether experimentally in animals, or pathologically in humans, gives the stools a characteristic appearance. In typical cases they are bulky, semi-solid, grey-white, and fetid because of putrefying and fermentative processes. As a rule there is a high content of solids. Occasionally "butter stools" in which the undigested fat separates out in a buttery mass are observed.

#### Microscopic Examination

One looks particularly for muscle fibres in which the transverse striations remain unchanged (Creatorrhoea). This occurs in the absence of trypsin. A more accurate technique has been described by Schmidt, and is known as the Schmidt Nuclei Test.<sup>10</sup> "With an ordinary meal a 0.5 gm. cube of beef, or better, of thymus, tied in a little gauze bag is administered. The meat must previously have been hardened in alcohol and well washed with water. When the bag appears in the faeces it is opened and the contents examined microscopically. If the nuclei are for the most part undigested pancreatic insufficiency may be assumed, since it is probable that nuclei can only be digested by the trypsin of the pancreatic juice. Provided the time of passage through the gastrointestinal tract is not less than 8 to 10 hours, the nuclei are normally digested. If the time exceeds 30 hours, nuclei may be partially digested in the complete absence of pancreatic trypsin."

#### Chemical Analysis

**Fat:** Total fats are extracted with ether, dried and weighed. The percentage of fatty acid is determined by titration with sodium alcoholate. Neutral fats are calculated by the difference.

**Nitrogen:** Is measured by the usual chemical methods.

**Pancreatic enzymes:** All workers are now agreed that the measurement of pancreatic enzymes in the faeces is of no diagnostic value whatsoever.

The methods of quantitative analysis of fat and nitrogen are exacting and tedious laboratory procedures and for this reason are not a part of routine laboratory practice.

#### Weight

This test was reported by Pratt in 1942,<sup>18</sup> following studies on a series of patients. Confirmation of his work is lacking. It avoids the necessity of chemical analysis. The patient is put on the Schmidt test diet for three days. The faeces passed while on the diet are preserved, dried, and weighed. His records show that the normal dry weight of faeces for the three-day test period is 55 gm., and that a weight of over 300 gm. is diagnostic of chronic pancreatic insufficiency. Other causes of steatorrhoea show lower values. For instance the average weight for patients with obstructive jaundice was 130 gm. Of course, weights below 300 gm. do not rule out chronic pancreatic insufficiency, but Pratt claims that weights over 300 gm. only occur in this condition.

#### Duodenal Analysis

##### Theoretical Background

Removal of a sample of the contents of the duodenum is the most efficient and reliable method

of studying pancreatic function. The secretion is removed directly as it leaves the gland, being mixed of course with bile and probably a small amount of succus entericus. Provided that the sample is not more than slightly contaminated with acid gastric contents, the pancreatic enzymes are stable for a sufficient period to allow them to be measured quantitatively.

The first gastrointestinal tube was designed by Einhorn in 1908, enabling material from various levels of the alimentary tract to be withdrawn for study. Sorensen, in 1909, established the physico-chemical conditions governing the activity of enzymes. Following this, adequate methods of chemical analysis were developed, beginning in 1912 with the researches of Willstatter et al in Germany. McClure and his associates began the first mass studies of duodenal fluid in 1921.

Various stimuli to the pancreas have been used in the several series which have been carried out since that time. These include various test meals, parasympathomimetic drugs, and secretin. Test meals are impractical and are rather haphazard means of stimulation. Of the parasympathomimetic drugs, mecholyl (acetyl-beta-methyl-choline hydrochloride) is the most widely utilized. It acts on the vagal endings to the gland and stimulates the production of enzymes. These drugs have the disadvantage of producing distressing subjective side-effects such as bradycardia and profuse sweating in a patient already harassed with 30 inches of rubber tubing and a knotty pancreas.

Lagerlof has done a great deal of research at St. Erik's Hospital in Stockholm using the hormone secretin.<sup>11</sup> This is published in a supplement to the *Acta Medica Scandinavica*, 1942, entitled "Pancreatic Function and Pancreatic Disease" and is a model of experimental work. It contains a complete review of previous research on pancreatic function and disease, excellent pathological and clinical descriptions, and the results of his own research. The use of secretin is being studied in medical centres in the United States. It is at present not practical for general use because of the difficulty of obtaining the pure hormone. Crystalline secretin is very expensive, and crude extracts have shown toxic properties.

His series show that a depression of amylase concentration is the first sign of pancreatic disease, and occurs in all but the mildest cases. This is a reversible change, and probably represents oedema of the gland without actual tissue destruction. A depression of the bicarbonate concentration is shown to be the earliest sign of permanent tissue damage.

These results are most promising, but the technique is not yet practical for general use. In our

opinion, the most satisfactory method at the present time is simply to withdraw a measured amount of duodenal fluid from a fasting patient. Duodenal analysis has failed to obtain wide usage. This is unfortunate, for the technique for clinical purposes need not be much more difficult than that of the gastric analysis.

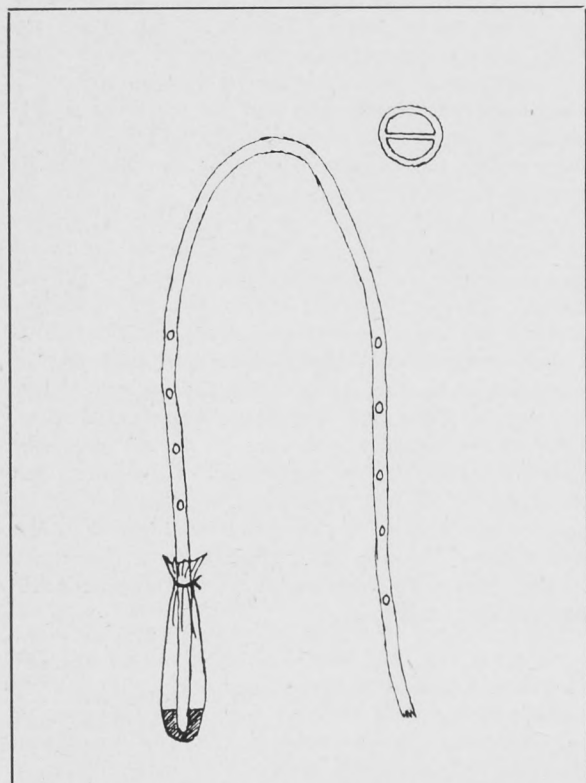
At present, and until further research may change the picture, our feeling is that the results of analysis of duodenal fluid from the fasting patient have to be regarded practically speaking on an "all or none" basis. That is to say either the fluid contains pancreatic enzymes in which case the pancreas is presumed to be functioning, or it does not contain enzymes, and the pancreas is presumed to be not functioning. Obviously a pathologic epoch has occurred between the functioning and the non-functioning pancreas. It would be an excellent thing to be able to visualize clinically some gradation of change from a normal pancreas to a completely occluded organ or a mass of fibrous tissue. The secretin test may make this possible. But on fasting samples, the experimental results even on normal individuals show a wide degree of variation so that it seems impossible to say where the normal ends and where the abnormal begins.<sup>4, 6, 8, 16, 18</sup> Certainly tables can be drawn up whose average values show significant gradations, but these are of no use in dealing with an individual case. One aspect of this work that needs to be developed is a rough, simplified, clinical procedure rather than more complicated albeit more accurate laboratory techniques.

Such a test has real practical value, and the fact that it cannot be given very great quantitative significance should not diminish it in the eyes of the clinician. The knowledge that the duodenum contains no pancreatic enzymes is an exceedingly useful piece of information. If a man of 55 has painless jaundice and no enzymes present, he has almost certainly a carcinoma of the ampulla of Vater or of the head of the pancreas, and not a stone or cancer of the bile duct. If he has indefinite epigastric pain, digestive disturbances, with or without steatorrhoea, with no enzymes present, he has either an obstructed pancreatic duct or pancreatic fibrosis (chronic pancreatitis) and can be treated accordingly. If an infant of a few months old is cachectic and passed bulky fetid stools, and no enzymes are found on duodenal drainage, it has cystic fibrosis of the pancreas, and not a coeliac condition, and should be immediately started on prophylaxis to prevent pulmonary complications.<sup>1</sup>

#### Nature of the Tube

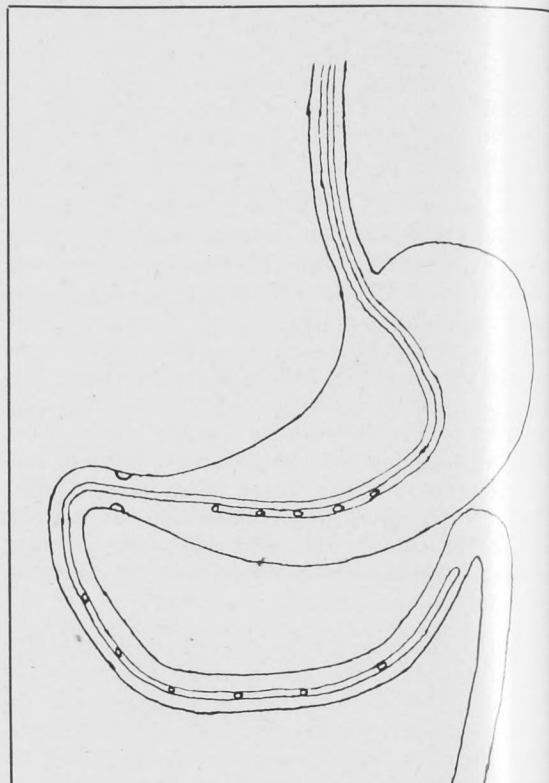
In order to pass through the pylorus, the tube must have a weighted end. This is accomplished by tying a small rubber bag containing .5 cc. of

mercury over the end. (Fig. 2) All air should be expressed from the bag before it is tied so that it will pass through the nose easily. In the Miller-Abbott tube one lumen opens into a balloon on the end into which mercury and 5 to 20 ccs. of air are passed when the tube is in the stomach, the purpose being to give an oval object for peristaltic waves to carry along. In our experience this arrangement has not seemed to facilitate passage of the tube through the pylorus.



**Figure 2.** Illustration of the double lumen tube which we found satisfactory for duodenal intubation. A small rubber bag containing 1.5 ccs. of metallic mercury is tied over the sealed end. If the bag is carefully trimmed, and most of the air expressed before tying, it will pass the nasal turbinates quite easily. In the upper right hand corner is shown a cross-section of the tube.

contaminated with gastric juice. The stomach can be kept as empty as possible by aspirating the other lumen every few minutes. Such a tube is not available commercially here. A very satisfactory model may be constructed from a Miller-Abbott tube by plugging the holes opening into the balloon, and cutting openings further back to drain the stomach, being careful not to cut the partition between the lumens. This is best accomplished by inserting a piece of wire of suitable diameter



**Figure 3.** A diagrammatic representation of the double lumen tube in position. One lumen opens into the stomach, the other into the duodenum. Between the two sets of openings there is 10 to 12 cms. of tubing which traverse the pylorus.

Agren and Lagerlof, in 1937, brought out a double lumen tube, constructed in such a way that one lumen opens into the stomach and the other into the duodenum. (Fig. 3) When the tube is in place constant suction of 50 to 100 mm. of mercury is applied to both lumens. In this way the stomach is kept empty, so that a pure sample of duodenal fluid can be obtained. Our experience has been that even with this arrangement a certain amount of gastric fluid escapes being drawn off and appears in the sample. We found it more satisfactory to draw off a cc. or two of duodenal fluid at a time, and to collect those samples which were not

down the appropriate lumen, and cutting down onto it with a pair of scissors.

#### Method of Obtaining a Duodenal Sample

The only preparation which the patient requires is that he should have had no food for twelve hours and no fluid for four hours. The best time to obtain the sample is first thing in the morning.

The tube is passed into the stomach as for the gastric analysis. The residual gastric contents are aspirated with a syringe. The patient is then required to lie down on his right side. The tube is withdrawn until the end is at the cardia and then

is slowly passed down so that the weighted end will fall into the pyloric antrum. The slight resistance as the tube reaches the pylorus is felt at the 70 cm. mark in the average subject. About 10 cm. of slack are passed in, and it is left until it has entered the duodenum. To avert the possibility that the end of the tube may curl back into the stomach, it is usual to pull it back and replace it every twenty or thirty minutes. If the tube does not go through the pylorus in a reasonable length of time (1½ to 2 hours), passing a hundred ccs. of warm (45° C) water down the tube will sometimes help by stimulating peristalsis and relaxing the pylorus. This water must be allowed to pass down the intestine or be withdrawn before beginning to take the sample. The length of time required for the tube to enter the duodenum has been found to vary with the shape of the individual's stomach, his age, his psychic state, and whether or not the operator has made an appointment for lunch.

It is quite easy to tell the position of the tube by the nature of the fluid withdrawn. Duodenal fluid is characterized by being clear, bile stained, and neutral to litmus paper. Gastric fluid is cloudy due to precipitated mucus, may or may not be bile stained, and turns blue litmus paper red. Therefore only rarely is fluoroscopic confirmation of the position of the tube necessary. It should be allowed to pass 15 to 20 cms. beyond the pylorus and held there while the sample is obtained. Our procedure has been to withdraw small samples with a syringe. Those which are clear and neutral are kept; those which are cloudy and acid are discarded.

#### Collection of the Sample

Ten to 20 ccs. of duodenal fluid are collected in an ice-cooled flask containing an equal quantity of glycerol (preservative). The pH should be checked to make sure it is between 7.0 and 8.0, and the flask kept in a refrigerator. The enzymes are unstable even at 5° C, and analysis should be carried out as soon as possible.

#### Interpretation

Whatever method of analysis is chosen, it is necessary to know the normal values of enzyme concentrations for that method. Individual cases will vary from roughly 35% to 250% of the average of all normal values for that series. If a patient shows values below 20 to 25% of the average normal value he may be assumed to have an obstructed or non-functioning pancreas. A low value should always be confirmed at least once and preferably three or four times.

It is not necessary to test for all three enzymes although if facilities are available it is a good idea to do so. This provides a check on the results of the analysis. Also a few cases are recorded of apparent congenital deficiency of one enzyme. Lagerlof feels that it is sufficient to test only for amylase<sup>11</sup>; Anderson tests only for trypsin.<sup>1</sup>

#### Summary

A general outline of the laboratory methods of detecting pancreatic disease is presented. The theoretical background, method, and interpretation of these tests are described in some detail. It is concluded that serum analysis are the matings, and duodenal analysis are the most valuable, provided that equipment is available. The former is used in acute or sub-acute conditions, and the latter in chronic or fibrotic lesions.

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#### Bibliography

1. Anderson, D. Pancreatic Enzymes in the Duodenal Juice in the Coeliac Syndrome. *Am. J. Dis. Child.* 63; 643, 1942.
2. Best and Taylor. *The Physiological Basis of Medical Practice.* 4th ed. Williams and Wilkins Co., 1945.
3. Bodansky, M. & Bodansky, O. *Biochemistry of Disease.* MacMillan Co., 1940.
4. Comfort, M. W. Tests of Pancreatic Function. *J.A.M.A.* 115; 2044, 1940.
5. Comfort, M. W. & Osterberg, A. E. Lipase and Esterase in Blood Stream. Their Diagnostic Value in Pancreatic Disease. *J. Lab. & Clin. Med.* 20; 271, 1934.
6. Comfort, Parker & Osterberg. Concentrations of Pancreatic Enzymes in the Duodenum of Normal Persons and Persons with Disease of the Upper part of the Abdomen. *Am. J. of Dig. Dis.* 6; 249, 1939.
7. Fowweather, F. S. The Determination of The Amount and The Composition of the Fat in the Faeces. II. *Br. J. of Exper. Path.* 7; 7, 1926.
8. Free, A. H., Beams, A. J. & Myers, V. C. Studies of the Enzyme Activities of Duodenal Contents as a Means of Evaluating Pancreatic Function. *Gastro-Enterology.* 1; 188, 1943.
9. Ivy, A. C. Certain Aspects of Applied Physiology of the External Pancreatic Secretion. *Am. J. of Dig.* 676; 3, 1937.
10. Kolmer, John A. *A Clinical Diagnosis by Laboratory Examinations.* D. Appleton Century Company, 1944.
11. Lagerlof, H. O. Pancreatic Function and Pancreatic Disease. *Acta Medica Scandinavica.* Supplement CXXVIII, 1942.
12. Levinson & MacFate. *Clinical Laboratory Diagnosis,* 3rd ed. revised. Lea and Febiger Co., 1946.
13. Mitchell-Nelson. *Text-book of Paediatrics.* 4th ed. revised. W. B. Saunders Co., 1945.
14. Moorhouse, J. A. A Concept of the Activity of Pancreatic Lipase. *University of Manitoba Medical Journal.* 19; 69, 1948.
15. Moorhouse, J. A. & MacFarlane, C. J. Pancreatic Disease I. *University of Manitoba Medical Journal.* 20; 66, 1948.
16. Myers, V. C., Free A. H. Clinical Enzyme Studies. Factors Involved, Clinical Usefulness, and a Suggested Method of Expressing Enzyme Activities. *Am. J. of Clin. Path.* 13; 42, 1943.
17. Pratt, J. H. A Study of Steatorrhoea with Special Reference to its Occurrence in Pancreatic Disease and Sprue. *Am. J. of Med. Sci.* 187; 227, 1934.
18. Pratt, J. H. Pancreatic Disease. The Frank Billings Lecture. *J.A.M.A.* 120, 1942.

## Polycythemia Rubra Vera

(Osler Vaquez Disease)

J. M. Bowman

Vaquez, in 1892, first described a case of Polycythemia Vera and claimed that it was caused by hyperactivity of the hematopoietic system. Eleven years later Osler described all the essential features of this disease, in a paper entitled "Chronic Cyanosis with Polycythemia and Enlarged Spleen; A New Clinical Entity."

He discussed four cases of his own and five others gleaned from the literature. The first, a forty-four-year-old doctor, first came to him in 1901 with rapid pulse, cyanosis and albumin in his urine. His cyanosis was more marked on cold days and a drop of blood from his ear was almost black in color and very viscid. This patient repeatedly had a red blood count of 8 to 10 million with a hemoglobin of 120. He also had a systolic hypertension of 200. During a year of observation he remained persistently cyanosed and his spleen was always palpable although never greatly enlarged.

The second case was a 35-year-old Russian Jew who was admitted to hospital in 1900 complaining of constipation. This patient was a dark color and on examination was found to have 7.2 million erythrocytes and a hemoglobin of 120 per cent. In 1901 he was re-admitted vomiting and there was blood in the vomitus. His red cell count at that time was 8.9 million per cubic millimeter and he was markedly cyanotic. The following year he was seen three times with the same high erythrocyte count. In November of 1902 he complained of a pain in his left side under the ribs. Although the spleen was never palpable this pain was most likely, in the light of our modern knowledge, due to a splenic infarct.

Case three was a female aged 44 years, seen in April, 1903, with cyanosis of her entire body and a markedly suffused conjunctiva. The lips, tongue, and buccal mucosa were a dusky blue color and distended venules were noted about the nose and cheeks. Her spleen was palpable three inches below the costal margin. This patient had an erythrocyte count of 11.6 million and one month later on re-examination it was found to be 10.7 million.

His final case was a Turkish Jew aged 46, whose chief complaints were chronic headache, weakness, diffuse abdominal and leg pains, chronic constipation, and occasional attacks of shortness of breath. In 1899 his skin began to grow much darker and of a bluish purple tint. At this time besides his generalized cyanosis, his liver was palpable although his spleen was not. His optic discs were hyperemic and the retinal vessels engorged. His blood was very dark and viscid, his erythrocyte

count in 1903 on the day he died was 8.2 million. Autopsy report showed some emphysema, edema of extremities, and moderate enlargement of the spleen.

Osler follows the description of his four cases with a short summary of five similar cases which he had obtained from the literature. Vaquez' original case recorded in 1892, was of a 40-year-old male with cyanosis of the extremities for ten years, an erythrocyte count of 8.9 million and a hemoglobin of 165 per cent. He had vertigo, pain in his lumbar region, and hematuria. Both liver and spleen were enlarged.

Cabot, in 1899, reported two cases. The first a 46-year-old female who in 1893 had a cerebrovascular accident with residual facial paresis. In 1897 she began having periods of mental confusion and muscular collapse. Her face was a plum color and her erythrocyte count was 10.5 million. She died in 1899 and autopsy revealed a middle meningeal hemorrhage with passive congestion. Cabot's second case had an enlarged spleen and an erythrocyte count which ranged from 9 to 12 million. Venesection was practised in this case but the red cell count remained at about 11 million.

Two other cases are commented on by Osler. One, a 53-year-old male with cyanosis of skin and mucous membranes, dyspnea, clubbing of fingers, a palpable spleen and an erythrocyte count of 9.1 million. The other was a 43-year-old male with abdominal pain, and enlarged spleen which extended to the umbilicus, cyanosis of the face, clubbing of the fingers, dulling of his memory and speech. His red cell count was 9 million and autopsy showed left ventricular hypertrophy and an enormous spleen weighing 1440 grams. The brain was markedly congested.

In an analysis of the nine cases the age range was from 35 to 53 years. There was nothing in their occupation or personal life common to them all. Cyanosis, a markedly elevated red cell count, hemoglobin and blood viscosity were present in all nine. In seven of the nine cases the spleen was enlarged, in four cases markedly enlarged. In one case there was no record, and in one the spleen was not clinically enlarged. In this series of nine Osler found that in the majority of cases the leucocyte count was not raised but in three cases was below four thousand per cubic millimeter.

Symptomatology was very varied. Most complained of headache, weakness, and prostration, pains in the back, abdomen and extremities, nausea and vomiting. Fever was not seen in any case.

Osler proceeds to differentiate two types of polycythemia; relative, due to dehydration from sweating, diarrhea, vomiting, etcetera; and absolute polycythemia where the red cells are actually increased. In this class are the poly-

cythemias of high altitudes, pulmonary emphysema, congenital heart disease and the above idiopathic polycythemia. He states that it is not easy to offer an explanation for Polycythemia Rubra Vera nor to connect it with enlargement of the spleen. He writes: "Further investigation will determine whether in reality we have here a new disease. The clinical picture is certainly very distinctive; the symptoms, however are indefinite and the pathology quite obscure."

In 1907 Osler, the Regius Professor of Medicine at Oxford, delivered a clinical lecture on Polycythemia Vera, wherein he presented a typical case of polycythemia. In this lecture he draws an analogy between this disease and leukemia. He goes on to say that erythrocytic increase per cubic millimeter of blood may be due to loss of plasma; lessened destruction of erythrocytes; increased production of erythrocytes. In six post mortems he reports intense hyperplasia of the erythroblastic elements in the marrow mostly in the mature stages, and states that here there is a condition of over production of red blood cells. He theorizes on the reason for such an over supply. One view being that there is some qualitative difference in the hemoglobin of the cell, causing it to be of poor oxygen carrying power, and necessitating an increase in the number of cells to carry an adequate amount of oxygen. Another possibility is that due to capillary dilation with slowing of the blood flow each erythrocyte cannot discharge its proper cargo, and that therefore a greater number are necessary. Osler concludes by stating that the cause is unknown. At this early date (1907) Osler advises venesection to be repeated frequently, as a treatment which gives marked relief. He also states that X-ray radiation of the splenic area is being tried experimentally.

Forty years later our knowledge of the disease has advanced somewhat. We are making strides in therapy but a comprehension of its etiology and therefore of a permanent cure eludes us still. Very little has been added to the clinical description given by Osler. However, the pathology of polycythemia vera has been elucidated and some observations have been directed towards the fundamental nature of the disease.

As stated before, the cause of Polycythemia Vera is not known. Some cases are familial. These are marked by a benign course and little splenomegaly. Some cases may be endocrine, as polycythemia may be found in pituitary basophilism, hyperthyroid disease and suprarenal disease. However, most cases of polycythemia vera are not familial nor can any endocrine disturbance be found. Also, splenic tuberculosis and thrombosis of the splenic vein although associated with erythrocytosis are not the cause in the vast majority

of instances. Retznikoff states that none of the above states can cause Polycythemia Vera nor is it a truly neoplastic disease because of the absence of abnormal (immature) cells and its lack of invasiveness. Other theories such as damage to higher brain centres, encephalitis, excess of a hypothetical gastric hormone certainly cannot account for the majority of cases.

The production of erythremia in animals by ingestion of cobalt and the prevention of such erythrocytosis by the administration of ascorbic acid are of interest. One worker suggests that cobalt produces polycythemia by persistent vasodilation of the marrow vessels causing anoxemia of the marrow and marrow hyperplasia. Another suggests that cobalt causes an inhibition of respiratory function of the mature red cells which are released into the circulation.

Statistically, polycythemia is found more commonly among Middle European Jews of the male sex. Buerger's disease (Thromboangiitis Obliterans) has the same racial, age, and sex incidence. Also the two diseases are occasionally found together. When the marrow of sixteen polycythemia patients was examined, using Masson's trichrome connective tissue stain, they all showed markedly thickened capillaries and in a majority of cases adventitial and subintimal fibrosis of the marrow arteries. Changes similar to these are found in the peripheral vessels of patients with Buerger's disease. Sixty-four control marrows did not show these lesions. Thus, the cause of this disease may be similar to Buerger's disease which is also not completely known but is believed by many to be inflammatory. Similarly, in two early cases of polycythemia vera the vessels showed inflammatory lesions along their course. The above vascular lesions by occluding the marrow vessels and causing marrow anoxia are in Retznikoff's view the cause of Polycythemia Vera.

The usual pathological findings are engorgement of blood vessels with frequent thromboses and hemorrhages. Spleen and liver are both enlarged and engorged. The marrow is congested and is characterized by erythroblastosis, leucoblastosis and megakaryocytosis.

Polycythemia Rubra Vera is marked by a very insidious onset. Vague early symptoms include headache, dizziness, a feeling of fullness in the head, weakness, fatigue, shortness of breath, tinnitus, numbness of the extremities, mild confusion. The peculiar plum colored cyanosis is a notable feature of the disease and is due to the intense engorgement of the superficial vessels. Constipation, dyspepsia and flatulence are frequent and may be due to congestion of the gastro-intestinal mucosa. Peptic ulcer occurs in 10% of cases. Thrombosis is very common and may involve any

vessel—cerebral, coronary, mesenteric, splenic vessels being commonly involved. Hemorrhage is very common in erythremia due to the great increase in actual total blood volume (double the normal). Despite this increase in blood volume the blood pressure is usually only moderately increased.

Hematologic findings parallel those of Osler. Erythrocyte count ranges from 8 to 12 million per cubic millimeter, the hemoglobin from 120-160 per cent. The erythrocytes are usually normocytic and hypochromic.

The tendency towards hemorrhage is due to poor clot retraction, and thrombosis is due to the increased cellular elements and therefore greater viscosity (1.075 to 1.080). The hematocrit reading is usually over 65 and may be as high as 84. Other findings are frequent albuminuria, slightly elevated basal metabolic rate, and increased fecal urobilinogen.

It may be remembered that Osler drew an analogy between Polycythemia Vera and leukemia. In some cases polycythemia appears to terminate as myelogenous leukemia. This has led to some writers describing so called erythro-leukemia as a disease entity. These cases are probably primarily leukemia, with an erythrocytosis due to irritation of the contiguous erythroblastic elements of the marrow in the initial stages of the disease. This is similar to the leucocytosis Polycythemics frequently have.

Prognosis in this disease is varied. A patient usually lives ten to fifteen years after the onset of symptoms. However, the disease is ultimately fatal, usually terminating with the thrombosis of a cerebral or coronary artery. Death is rarely due to the frequent hemorrhages which occur. An intercurrent infection may carry the patient off. The occasional patient may develop an aplastic anemia or thrombocytopenia due to exhaustion of the marrow.

At present no permanent cure is possible for this disease and the object of treatment is to alleviate symptoms and prolong life.

According to Fowler the most successful therapy is repeated venesection first practised by Osler (combined with irradiation of the erythropoietic centres). Five hundred ccs. of blood are removed daily or every other day until the hematologic picture approaches normal. Fowler states that the blood removed may be used for transfusion purposes. A low iron diet is not essential as the blood removed quickly causes an iron deficiency state. Only moderate amounts of irradiation should be used over the active bone marrow sites; also the spleen should be protected from the action of the rays because it is the organ chiefly concerned with erythrocytic destruction. Spray

irradiation of all the erythrogenic centres has been advocated but care must be taken to prevent too severe marrow depression with resultant aplastic anemia.

Of the drugs, phenylhydrazine hydrochloride 0.1 grams orally every other day until the red cell count begins to fall has been used although its less toxic relative, acetyl phenylhydrazine is favored. These are hemolytic drugs and therefore may produce nausea, vomiting, anorexia, jaundice, weakness, and hematuria, and also an increased tendency to thrombosis. They are cumulative in their action and must be stopped, well before the red cell count reaches normal limits; otherwise a severe anemia will be produced. Many other drugs have been used only to be abandoned. Fowler's solution, although effective, is no longer used. Gastric lavage to remove the erythropoietic factor is useless. Liver extract is valueless. Benzol is much too toxic. Splenectomy is definitely contraindicated.

A new drug, radio-active phosphorus, is proving of value. Doan maintains that venesection or phenylhydrazine do not control the marrow hyperplasia adequately, thrombocytosis particularly being unaffected and also the leucocytosis. These two phases are controlled much better by the use of radio-active phosphorus. This control of all three factors is said to materially increase longevity. Doan treated twenty patients with this drug. Fifty per cent obtained remissions lasting five to nineteen months. Only two were unimproved. Excessive depression of all three marrow elements is the danger which must be avoided with radio-active phosphorus therapy.

Nitrogen mustard has also been used with some success but it is too early to compare its efficacy with that of radio-active phosphorus.

General therapeutic measures must also be remembered. Bed rest tends to increase the liability of thrombosis. Bland foods should be taken to lessen irritation of the already congested gastric mucosa.

Polycythemia is a relatively rare disease as evidenced by the few admissions recorded of victims of this disease to the Winnipeg General Hospital. About four Polycythemia Vera patients are admitted each year. Of these a good number are admitted for some other condition primarily. Between 1944 and July, 1948, ten admissions were recorded representing eight patients. Two were not true polycythemics, and another, a known polycythemic, was admitted markedly anemic due to gastric hemorrhage. A fourth was a doubtful case having a hemoglobin of 116 and a red count of 6.5 million. These figures actually are not too abnormal for a healthy young male adult. Four cases were proven polycythemia victims with red

counts ranging 6.9 to 8 million. Three were treated by venesection and one with acetyl phenylhydrazine. In each case the erythrocyte count was reduced satisfactorily. One died a year later of intra abdominal hemorrhage. The other three have not been re-admitted to the Winnipeg General Hospital and their present condition is unknown.

## Obstructive Jaundice: Two Cases

A. E. Rodin

Two cases of obstructive jaundice will be presented. Beforehand it may be advisable to give a brief summary of the various causes and findings in this type of jaundice.

### Definition

Obstructive jaundice is a yellow discoloration of the skin, sclerae, and internal surfaces of the body produced by the accumulation, in the blood, of bilirubin which, having traversed the liver cells, is unable to reach the duodenum due to obstruction in the biliary passages (except for the cystic duct).

In the normal hemolysis of the red blood cells, hemoglobin is broken down into two entities, one of which is the iron containing elements and the other which is bilirubin combined with protein (or Bilirubin I). Bilirubin I traverses the liver cells, and protein is removed leaving uncombined bilirubin (called Bilirubin II). In obstructive jaundice, Bilirubin II accumulates in the biliary passages and re-enters the circulation.

### Etiology

Obstruction of the biliary passages may be produced by a multitude of factors.

1. **Extra Hepatic** (hepatic and common bile ducts).

a. Congenital—Malformation of bile ducts.

b. Calculus—Occlusion of the common duct by gall-stones.

c. Infective—Acute and chronic cholangitis, Chronic pancreatitis, Inflammation of the duodenum closing the ampulla of Vater.

d. Malignant—Carcinoma of the bile ducts, Carcinoma of the pancreas.

e. Misc.—Dyskenesia of the bile ducts, Post-operative stricture, Pressure from without.

2. **Intra Hepatic** (bile canaliculi.)

a. Cholangiolitis—Primary and secondary.

b. Infection of the liver—Infectious hepatitis.

c. Carcinoma of the liver—Primary and secondary.

### General Characteristics of Obstructive Jaundice

In all cases of obstructive jaundice there are many similar findings which are related to the retention in the blood of the contents of bile—especially bilirubin, bile salts and cholesterol.

### References

1. Osler, Wm.—Chronic Cyanosis with Polycythemia. *Am. J. Med. Science.* 152: 187-201, 1903.
2. Osler, Wm.—Erythremia. *Lancet.* 1: 143, 1908.
3. Reznikoff, Paul—Polycythemia. *Symposium on Blood.* Univ. of Wisc. Press. 1: 207, 1939.
4. Fowler, W. M.—Hematology for Students and Practitioners. 1945. New York, London, P. B. Hoeber.
5. Reinhard, E. H., et al.—Treatment of Polycythemia Rubra Vera. *J. Lab. & Clin. Med.* 31: 107-215, Feb., 1946.

1. **Symptoms** — These are usually anorexia, weakness, pruritis, some loss of weight, and gastrointestinal upset. The pruritis has been shown to be due to the retention of bile salts in the blood.

2. **Signs**—A yellow discoloration of the skin and sclerae is the only visible sign on physical examination. There is often a bradycardia.

### 3. Laboratory Findings—

#### A. Blood

a. An increased Icterus Index and a direct Van Den Berg reaction are found due to the accumulation of Bilirubin II (protein removed) in the blood.

b. The cholesterol blood level is increased due to the obstruction of the normal excretory pathways of cholesterol.

c. The alkaline phosphatase level in the blood is above 10 units (2-4 being normal) in 90% of cases of obstruction of the bile ducts.

d. The blood clotting time is increased due to a decreased blood prothrombin level. Vitamin K, which normally acts in the liver to form prothrombin, cannot be absorbed from the intestine in obstructive jaundice because of the absence of the necessary bile salts.

#### B. Faeces

a. The stools become lighter in color because of the absence of stercobilinogen which imparts to the faeces its normal color. As it is formed in the intestine by the action of bacteria on bilirubin, stercobilinogen is absent in obstructive jaundice where bile cannot enter the intestine.

b. The stools contain much fat because bile salts, which are necessary for its absorption, are not present in the intestine.

#### C. Urine

a. The urine appears darker in color due to the presence of Bilirubin II (protein removed) which is excreted through the renal filter. Bilirubin, when combined with protein cannot pass the renal filter, but Bilirubin II can.

b. Urobilinogen is not formed due to lack of bile in the intestine and is consequently absent from the urine, its normal excretory path.

## Differential Diagnosis in Obstructive Jaundice

In seeking out the etiology of obstructive jaundice, all findings must be considered. They may be divided into 1. general findings due to obstruction of the biliary passages and 2. findings produced by the etiological factor aside from obstruction. It is on these latter findings, if any, that a differential diagnosis can be made. Below are some examples.

**1. Symptoms**—In gall-stone obstruction there is often a history of biliary colic in the patient who is female, fat, forty and fruitful. Infectious hepatitis is usually accompanied by fever, general malaise, headache, nausea and vomiting. In carcinoma of the head of the pancreas the most significant findings are loss of weight, accompanied by weakness.

**2. Signs**—These are the least informative in differential diagnosis. There may be enlargement of the liver in infectious hepatitis or carcinoma of the liver. A distended gall bladder is sometimes palpable in carcinoma of the head of the pancreas. Splenomegaly is not as common in obstructive jaundice as in hemolytic or hepatogenous jaundice. However, 8% of gall-stone obstructions and 20% of malignant obstructions are accompanied by splenic enlargement, in the advanced stages. The presence of ascites indicates recent liver damage or hepatitis and is not usually seen in early malignant obstruction.

**3. Laboratory Findings**—An infective obstruction will not produce as high or as permanent an Icterus Index as a malignant obstruction, because the former is not as complete and is reversible. There are, however, many exceptions. Liver function tests (e.g. cephalin flocculation test) will be positive only when obstruction is due to liver damage or infection.

**4. Time**—Often the only way to differentiate carcinoma from infective causes which produce no fever (such as cholangitis) is to wait a certain period of time (say three or four weeks) after the jaundice has appeared. If there is no remission of symptoms or laboratory findings by then, there is a strong indication for carcinoma.

**5. Surgery**—Surgery is not used merely as a method of differential diagnosis unless the obstruction is permanent and with no significant past history of infection.

The following two cases of obstructive jaundice presented some difficulty in diagnosis. The first had many symptoms over a period of months and the second had few symptoms over a period of weeks.

### Case I

Mrs. J. S., a Canadian, age 59, of Dutch descent, was admitted to the St. Joseph Hospital on Aug. 3, 1948. The chief complaints were anorexia, loss of

forty pounds in four months, pain in the right upper quadrant radiating to the back, some intolerance to green vegetables and frequent dizzy spells—all dating from February, 1948. There was no past history of gall bladder colic, jaundice or contact with hepatogenous toxins. She had been fully investigated by a clinic in June, 1948, with completely negative findings. On admission physical examination was negative. There was no fever at any time.

On Aug. 4, 1948, the patient began to appear yellow, and pass putty colored stools and dark urine. Itchiness was present. Laboratory examination revealed urine positive for bile, icterus index 65 units, and prothrombin time 71%. A diagnosis of obstructive jaundice due to gall stones was made. On Aug. 13, 1948, a laparotomy was performed, carcinoma of the head of the pancreas with spread to the mesenteric lymph nodes found, and a cholecysto-enterostomy done. The patient is still in the hospital and complaining only of weakness.

### Case II

Mr. H. H., a Canadian, age 63, of Polish descent, was admitted to the St. Joseph Hospital on July 8th, 1948. The complaints were anorexia, since June 28th, 1948, and yellow skin, brown urine, and weakness since June 25th, 1948. The loss of weight in two weeks was six pounds. There were no other complaints and no past history of any illness or contact with hepatogenous toxins. Physical examination revealed only severe jaundice. There was no fever or liver tenderness at any time.

Laboratory examinations on July 8, 1948, revealed an icterus index of 260 units, an immediate direct Van Den Berg reaction, a sedimentation rate of 22 mms. in one hour. A prothrombin time was not done. A tentative diagnosis of malignant obstruction of the common bile duct was made.

On July 11th, 1948, the patient's appetite returned with disappearance of weakness. Two days later his icterus index was found to be 120 units. On July 23rd, 1948, he was discharged with no complaints and with almost complete disappearance of the jaundice. The final diagnosis was catarrhal jaundice.

### Discussion

The preceding two cases were interesting from the point of view of differential diagnosis. Case I did not present the typical painless jaundice of carcinoma of the head of the pancreas, but presented what appeared to be a gall-stone obstruction because of the history of right upper quadrant abdominal pain and because of some intolerance to green vegetables. On reviewing the history, many findings which might have led to a suspicion of carcinoma, were seen. The history was only of five months duration, with no past history of gall bladder infection. The loss of weight, characteristic of carcinoma of the head of the pancreas, was

marked. Gall bladder visualization, two months before the appearance of jaundice, was normal. However, as a laparotomy is indicated in either carcinoma or gall stone obstruction, the differential diagnosis between the two was not vital in this case. The cause of pain was not ascertained.

Case II presented what appeared to be a typical case of painless obstructive jaundice due to carcinoma of the head of the pancreas. The icterus index was very high. There was some loss of weight. Fever was absent. On reviewing the history no manifestation of infection could be found. Fortunately the patient was observed for a period of time before operation was undertaken, and in that time his symptoms cleared up. The diagnosis of catarrhal jaundice (inflammation at the ampulla of Vater) was made because of the remission of symptoms; the complete absence of a gall bladder history or of contact with hepatogenous toxins, and the lack of fever, nausea, vomiting and headache, characteristic of infectious hepatitis.

### Conclusions

Conclusions cannot be drawn from only two cases, but it should be evident that differential diagnosis in obstructive jaundice is difficult and often deceptive. Painless obstructive jaundice usually means carcinoma of the head of the pancreas, but, more rarely, may be due to a cholangitis. The height of the icterus index cannot always be used as a means of differentiation between carcinoma and infection.

## A Brief Survey of Fictional Medicine

It is regrettable that in the teaching of medicine no consideration is given to the incidence, symptomatology, diagnosis and treatment of various medical and surgical conditions occurring in fiction. Such a lack of insight is often a source of considerable embarrassment to the practitioner or medical student. Not infrequently does the doctor or potential doctor find himself listening to the radio, attending a play, or watching a motion picture in the company of a lay person or persons. During the course of such entertainment the doctor will frequently be called upon to give a discourse on the various symptoms and symptom-complexes occurring in the art-form, and will find himself unable to do so. Moreover, his embarrassment is further augmented when his lay companion makes a correct diagnosis and presents an intelligent discussion of the case.

The lack of instruction in this important aspect of medicine is not confined to Manitoba, for the vast majority of medical schools on this continent deny the existence of this field of the profession. Moreover, there is a marked paucity of information in the literature concerning this subject. Thurber<sup>1</sup> has made a small attempt in a recent series

However, if a complete history is taken, if the required laboratory tests are not only done once but repeated, and if the fundamentals in anatomy and physiology are understood, a diagnosis can be reached in the majority of cases. In the others, the addition of perseverance and patience is required.

### Summary

1. The abnormal physiology of obstructive jaundice was discussed.

2. Two cases of obstructive jaundice were presented. The first was a painful obstructive jaundice due to carcinoma of the head of the pancreas. The second was a painless obstructive jaundice due to catarrhal jaundice.

3. Painless jaundice may be caused by cholangitis or catarrhal jaundice. The height of the icterus index is not as valuable as a determination of its variability. A complete history and repeated laboratory tests are important in differential diagnosis.

The writer wishes to express his thanks to Dr. Kilgour for his constructive criticism on the first draft of this article.

### References

1. Hanger, F. M.—Jaundice, Cecil's Textbook of Medicine, 845-856, 1947.
2. Best, C. H., and Taylor, N. B.—Jaundice, The Physiological Basis of Medical Practice, 776-783, 1943.
3. Peikoff, S. S.—The Physiology, Diagnosis and Surgical Aspect of Jaundice, Manitoba Medical Review, 304-310, June, 1948.
4. Boyd, W.—Jaundice, Boyd's Textbook of Pathology, 567-572, 1947.

of articles, but he is limited because of a lack of orthodox training in the field. Pereleman<sup>2</sup> has made a similar attempt and he is hampered for similar reasons. Furthermore, since the observations of these and other investigators have not been published in recognized journals, it is doubtful whether the majority of the profession is aware of their work.

A complete survey of this field of medicine is quite impossible in the limited space available. It is to be hoped that in the near future one can expect a text or texts comparable to French or Cabot on this subject. In the interim, however, it is felt that a cursory and superficial discussion of the commoner conditions occurring in fiction would not be amiss, and it is with this in mind that this article is presented.

### Obstetrics and Gynecology

Only two conditions occurring in fiction are of importance: (1) Pregnancy and (2) Abortion.

#### Pregnancy

The prime symptoms and usually the only symptoms indicative of this condition are dizziness and fainting. The patient, commonly a recently

married woman, will complain of dizziness and will collapse, usually while in an argument with her husband. The significance of these complaints usually eludes the husband, who, when informed he is about to become a father, exhibits such a degree of amazement that the observer feels he has been an ardent believer in the parthogenetic theory, or that someone has tragically misinformed him about the phenomenon of reproduction. Signs of Pregnancy are classically absent. Amenorrhea is never mentioned, and there is a characteristic absence of abdominal enlargement—even in the third trimester. About the only condition to be considered in the differential diagnosis is brain tumor—since it may frequently give rise to dizziness and fainting. However, violent headaches usually accompany the symptoms, and the condition is infinitely more common in males. In my experience I have never encountered a case of brain tumor in a female.

### Abortion

When a pregnant woman falls downstairs, is picked up unconscious and rushed to the hospital where she undergoes immediate operative treatment, one can always assume she has aborted before the surgeon leaves the operating theatre and informs the anxiously awaiting husband. Other less common precipitating causes are automobile, train, or aeroplane accidents and falls from horseback.

In view of the major etiological factors concerned with abortion, it has been suggested that as a prophylactic measure the gravid female spend her entire gestation period on the ground floor of her home, and utilize no means of transportation more rapid than the ox-cart.

### Pediatrics

**Infantile Paralysis** is undoubtedly the commonest disease occurring in children. It is much commoner than coryza, croup, or chorea, and the physician should always think of this condition when a child begins to complain of fever and headache. The prognosis is poor. In a recent series I found pronounced residual paralysis remaining in 89% of the cases, and the necessity for iron lung therapy in 52%. Predisposing factors are important in the consideration of this illness. The child is usually quite athletically inclined and has aspirations of becoming a trapeze artist. He (or she) has dimples, speaks with a slight lisp, and is endeared by every member of the household. Problem children, psychopathic inferiors and mongolian idiots appear to have a natural immunity.

### Unexplained Fever (s)

Thurber<sup>3</sup> finds this condition common in children living in Soapland\*. The child is stricken with a sudden onset of fever, and rapidly passes

into a state of deep coma which usually persists over a period of weeks. Therapy takes the form of a recently discovered but unproven vaccine or serum, and is almost always successful. In the rare cases where this form of treatment fails, bringing together the estranged parents will evoke a cure.

### Surgical Emergencies

These are extremely common in children. The exact nature of the disease is never divulged. In practice I have found the following axiom applicable in 99 out of 100 cases. With any disease of childhood, where infantile paralysis and unexplained fever have been ruled out, surgical intervention is the only treatment, best performed by an operator especially flown in from a distant point.

### Surgery

Since this form of therapy is frequently resorted to in any and all fields of fictional medicine, a detailed discussion of all surgical conditions encountered would not be in order at this point. However, a brief survey of surgery as a whole will help clarify the fictional concept of this subject.

Surgical procedures, for the most part, are emergencies. Only rarely does one encounter elective surgery in fiction. As has been stated previously, the surgeon is usually flown in from a distant point, and is rushed to the hospital in a speeding motor car, flanked by at least three motorcycle policemen. Operations are most commonly performed around four o'clock in the morning under primitive conditions. Often the failure of the power supply necessitates the surgeon viewing the operating field with the aid of flashlight. Nurses and assistants collapse from exhaustion at the most inopportune moments, but this does not phase the operator. Kitchen table surgery, once extremely popular, appears to be going out of vogue, but it may be encountered occasionally and one should be prepared for it.

The patient will invariably require a number of blood transfusions. The blood group needed will always be Group AB Rh-, and it will never be available. During the course of the operation the patient will go into shock at least once, but heroic measures usually bring about an adequate response.

I have yet to encounter a post-operative complication.

### Neurology and Psychiatry

Only in recent years has this branch of medicine reached the commanding position it maintains over all other fields. Because of this sudden ascension, a more detailed and comprehensive approach would be useful to the reader, and this aspect of fictional medicine will be discussed under three headings: Diseases and Symptoms, Therapy, and Therapists.

\*The land of soap-opera.

### Diseases and Symptoms

**Brain Tumor**—This condition is the commonest malignancy occurring in fiction. Headache is the first, and may be the only symptom, but occasionally the patient will complain of dizziness and fainting. Sudden onsets of blindness and/or amnesias are not uncommon. The condition should always be considered when a patient complains of headache.

Treatment is surgical, under conditions cited elsewhere in this article.

**Paralysis**—Paraplegia is undoubtedly the commonest form of paralysis occurring in fiction. The causative factors are usually vehicular accidents, but occasionally falls from great heights produce this state. Rarely is the condition permanent, however. Two therapeutic methods are available:

- (1) Faith, which may or may not be followed by
- (2) Surgery.

**Amnesia**—In 95% of cases this is caused by blows to the head, and is invariably cured by similar measures. The response to this type of treatment is usually so successful that I have become convinced that a bludgeon should be included in the therapeutic armamentarium of the psychiatrist. In the rare case where the condition does not respond to a blow on the head, psychoanalytic therapy will be successful.

Whenever one encounters a state of amnesia in fiction, one can usually be certain that the patient will have acquired a new wife, vocation and temperament in the dissociated state. Such complications should always be considered before therapy is undertaken.

**Hysterical Fits**—This condition always resolves when the patient is slapped in the face. The harder the blow, the quicker is the resolution.

### Therapy

Four methods are practised in the neuropsychiatric field:

- (1) Faith and Hope.

The nil desperandum measures are, for the most part, practised in Soapland. Although the patient and/or his family have been advised that the case is hopeless, they continue to have faith. In the course of time, much to the embarrassment of the authorities, their hopes are invariably rewarded by complete cure.

- (2) Surgical (see above).

(3) **Traumatic**—slaps in the face, blows to the head (see above).

(4) **Psychoanalytic**—This form of therapy has become the treatment of choice in fiction. Patients recover extraordinarily rapidly when couch therapy is used. The average course of treatment requires about a week, after which the patient is discharged completely cured. More refractory cases may take a month, but I have encountered very few of these. The therapy is a veritable panacea, and it will cure everything from psoriasis to paresis. It is rapidly replacing penicillin.

### Therapists

**If a male**, the therapist is usually a lean, pipe-smoking individual with a propensity toward tweed suits. Occasionally he may be a stout, bearded person with a guttural accent, but this type is rapidly being replaced by the more romantic elements. He is remarkably adjusted to his environment. He has no worries or troubles. His car always starts on cold mornings, his shoelaces never break, and he appears to be immune to all the ailments ordinary man is prone. Some suspect God was created in his image.

**If a female**, the therapist is invariably beautiful, sympathetic, unmarried, high-bosomed, long-legged and slim-waisted. She always falls in love with her patient (a complication the married man should be aware of when he seeks treatment). After uncovering the origin of her patient's dilemma she will marry him. This undoubtedly accounts for the sparsity of psychiatrists in this country.

This has been but a brief review of a vast and new field of medicine—one whose boundaries are still vague and indistinct. It is hoped that this soupçon will stimulate further study and investigation. New disease entities and syndromes await conception and classification. Therapy is extremely limited and requires elaboration. The student would do well in considering this field for specialization.

One final word: An adequate approach to fictional medicine cannot be gained solely from printed matter such as this. The student or practitioner who refuses to co-relate his theoretical knowledge with his own experience in fiction will never be adept in this particular field, and should refrain from entering it.

— E. A. S.

### Bibliography

1. Thurber, James — Onward and Upward with the Arts. New Yorker, 24: 30-2 † May 29, 1948.
2. Pereleman, S. J.—Keep it Crisp. Garden City Pub. Co. (reprint) 1947, pp. 87.
3. Ibid.

## Osler and the Teaching of Medicine

Arnold Rogers

### I

If one could transpose oneself to the early 1890's, as a student about to enter the study of medicine in the New World, one would find new and exciting prospects opening at the Johns Hopkins Medical School in Baltimore.<sup>1</sup> The general educational level of those desiring admittance to this new school was high. An A.B. degree or its equivalent, plus a knowledge of French, German, and certain pre-medical subjects was demanded, and women students were admitted on the same basis as the male students. So unusual were these prerequisites, that there was some fear as to whether any students would be able to qualify, and Osler could tell Welch, with some truth, "Welch, we are lucky to get in as professors, for I am sure that neither you nor I could ever get in as students."<sup>1</sup>

The men who were to teach at this school are well known. Welch in Pathology, Osler in Medicine, Halsted in Surgery, Kelly in Gynaecology and Obstetrics, Howell in Physiology, Mall in Anatomy, and Abel in Pharmacology and Chemistry. Osler at forty, and Kelly and Mall at thirty-one were at the two extremes of age in this very young Faculty. From these men the student could receive a medical education in the United States that would compare favourably even when contrasted to the best that the great medical centres in Europe had to offer.

In 1893, the first class of seventeen students, fourteen men and three women, began their studies. They were fortunate, as we have said, in their choice of school, and in its staff. William Osler, as Professor of Medicine, was to play an important part in making their undergraduate training the success it was. The influence of this man on the students of those brave days was great, and it was as a teacher of the art that he exerted this influence. Though we cannot transpose ourselves to those days, except through the medium of imagination, let us nevertheless look at what he has to say to the students, and to the graduate student too, and see if we cannot recapture some of the spirit of the man and his day, through the message of his gifted pen.

In the instruction of medical students, Osler's method at Johns Hopkins was new, at least in the United States. The wards of the hospital served as his lecture theatre; the patients were the text; and the books and the articles were adjuncts to this natural study of patients with disease. The didactic lecture could be done away with, especially with small classes. The importance of this practical method of bedside instruction, where the stu-

dent could follow the hospital course of the patients in the assigned beds, can scarcely be overestimated. When Osler was about to leave Baltimore for the quieter life at Oxford, he could write of the method of teaching at the bedside: "Personally there is nothing in my life in which I take greater pride than in my connexion with the organization of the medical clinic of the Johns Hopkins Hospital, and with the introduction of the old-fashioned methods of practical instruction. I desire no other epitaph than the statement that I taught medical students in the wards, as I regard this as by far the most useful and important work I have been called upon to do."

In all his teaching, Osler strove to instil principles. In the green years, education was<sup>3</sup> "to instil principles, put the student in the right path, give him methods, teach him how to study, and early to discern between essentials and non-essentials." The principles to be instilled are as applicable today as they were fifty years ago. How to study, the knowledge of oneself, the recognition of disease, the narrowness of being taught naught but medicine, the importance of faith, the dangers of half-knowledge—these do not become out of date.

Introducing the address *Teacher and Student*, the following quotation from Plato is given: "It would seem, Adeimantus, that the direction in which education starts a man will determine his future life." In this address, the direction, or the influences that tend to make good students are given as the Art of Detachment, the Virtue of Method, the Quality of Thoroughness, and the Grace of Humility. The Art of Detachment is to lead one from the natural idleness and from some of youth's pursuits and pleasures; the habit of working regularly and systematically, so avoiding any need for cramming, with the continuation of these early ingrained habits into later professional life, helping to avoid "the common and fatal facility of reaching conclusions from superficial observations"—such are the constituents of the Virtue of Method; the Quality of Thoroughness, starting from the earliest studies, needs no elaboration as to its importance, and to its link with method. The Grace of Humility is the last influence listed, to be cultivated so as to avoid the "cock-sureness" based so often, not on fact, but on opinion. In regard to the need for humility it would prove an interesting exercise to make a list of the discarded theories and discredited treatments of previous years, including numerous "proven" facts, proved eventually to be only language concealing ignorance. The wisdom and strength of one such as Sydenham, "a man of many doubts," would go far

to avoid numerous errors, and instil in one "a judicious distrust and wise scepticism . . . the sinews of understanding."

To these four influences, inextricably intertwined with them, is the influence of the Master Word. In his address *The Master Word in Medicine*, is found a brilliant exposition of the power of the Master Word. Listen to the words delivered long ago in 1903, by one who was a prime exemplar of that devotion of which he spoke.<sup>5</sup>

"It seems a bounden duty on such an occasion to be honest and frank, so I propose to tell you the secret of life as I have seen the game played, and as I have tried to play it myself. You remember in one of the *Jungle Stories* that when Mowgli wished to be avenged on the villagers he could only get the help of Hathi and his sons by sending them the master-word. This I propose to give you in the hope, yes, in the full assurance, that some of you at least will lay hold upon it to your profit. Though a little one, the master-word looms large in meaning. It is the open sesame to every portal, the great equalizer in the world, the true philosopher's stone, which transmutes all the base metal of humanity into gold. The stupid man among you it will make bright, the bright man brilliant, and the brilliant student steady. With the magic in your heart all things are possible, and without it all study is vanity and vexation. The miracles of life are with it; the blind see by touch, the deaf hear with eyes, the dumb speak with fingers. To the youth it brings hope, to the middle-aged confidence, to the aged repose. True balm of hurt minds, in its presence the heart of the sorrowful is lightened and consoled. It is directly responsible for all advances in medicine during the past twenty-five centuries. Laying hold upon it Hippocrates made observation and science the warp and woof of our art. Galen so read its meaning that fifteen centuries stopped thinking, and slept until awakened by the *De Fabrica* of Vesalius, which is the very incarnation of the master-word. With its inspiration Harvey gave an impulse to a larger circulation than he wot of, an impulse which we feel today. Hunter sounded all its heights and depths, and stands out in our history as one of the great exemplars of its virtue. With it Virchow smote the rock, and the waters of progress gushed out; while in the hands of Pasteur it proved a very talisman to open to us a new heaven in medicine and a new earth in surgery. Not only has it been the touchstone of progress, but it is the measure of success in every-day life. Not a man before you but is beholden to it for his position here, while he who addresses you has that honour directly in consequence of having had it graven on his heart when he was as you are today. And the master-word is *Work*, a little one, as I have said, but fraught with momentous

sequences if you can but write it on the tablets of your hearts, and bind it upon your foreheads."

Of general advice, the essays and addresses are replete. Of *Aequanimitas*, a watchword for working and living; of the dangers of worship at the altars of strange gods, Bacchus particularly; of the benefits of systematic reading; of the advantages of the seeing eye, the hearing ear, and the carefully kept notebooks; of the dangers of early specialism; of the healthy scepticism bred in the P.M. room; of the wisdom of the masters of the art, men such as Hunter and Sydenham. All these topics, and many additional ones, still comprise interesting and informative reading. And to the advice specific to the student of medicine, there is more to be added of a more general nature, of books and libraries, of humanities and of humor, of universities and of laboratories, and of the universality of education, both in time and space.

Such are the lessons to be learnt in the message of the pen. And if we go back to our imagined student at Johns Hopkins in the 1890's, to the time that saw the beginning of "the heroic age of American medicine," we can see the sources of that student's enthusiasm. For in Osler, and Welch, and all the others, was to be found the spark of inspiration. It was from the work and spirit of such men that the greatness of Johns Hopkins had its being.

## II

On looking into a lecture theatre in the course of a lecture, a neutral observer will see two types of humans, those teaching, and those being taught. Among the latter are to be found a goodly number with a great deal of common sense beneath their cranial vaults. They listen to the lecturer, absorb much of what he says, and think their thoughts. Later, in "bull" sessions in the labs, in the canteen, and in the common rooms, there is talk, and criticism too, of the teaching. These thoughts are rarely brought to the attention of those doing the teaching. It would seem obvious that the man and woman undergraduate who in a year or so will be legally entrusted with the responsibility of caring for his fellow man, can today offer suggestions as to how their own course can be improved.

Some of the topics that the undergraduate considers long and often, are pre-med, lectures and lecturers, student-doctor relationships, examinations, the physical set-up at the College, including the library, canteen, common rooms, and the lowly lavatory. The many suggestions that have been bruited about the Broadway halls during the pre-med course, and in our own College concerning the above topics are the suggestions of many students. Most of these are old suggestions, but stating them from the students' viewpoint in a student journal, with some constructive suggestions by these students, should be worthy of consideration.

### Pre-Medical Studies

What can one say of the pre-med years? Student opinion has been voiced,<sup>6</sup> and Dr. J. C. Hossack has written wisely of pre-medical education in retrospect.<sup>7</sup> The course in Manitoba now stretches out one year more, making a total of three. Whether this will add to the value of the pre-medical education remains to be seen. But some opinions of the value of the old two-year course bear repeating.

The first year pre-med (also the old grade 12) was an interesting and valuable year. The courses in the sciences and maths were good introductory courses, English introduced other authors and works to us, and our embryo essays were of use to those who worked at them. The year, though called the first year pre-med, was equally the first year of the arts, science, or other courses. It was a year well spent, with ample leisure to read and to play.

The second year saw the young hopefuls in a different situation. Three to four hundred students were aspiring to positions open only to sixty. Here there was no leisure and no light. The toil was arduous, and consisted of much memorizing, with little understanding. A physics laboratory course could be taught without benefit of a lab. The microscopes of zoology and botany were poor instruments, how poor we only realized when we first saw the beautiful images in the microscopes in Dr. Bowie's histology lab. The zoology and botany courses themselves were compendia of knowledge, to be digested and absorbed so quickly as to produce mental dyspepsia. English and the language courses could not be enjoyed in such a dismal atmosphere. On top of the vast quantity of work we were supposed to absorb, there was the ever-present worry of admission over our heads. Psychologically this was as bad as could be.

The value of this year to the student was minimal. The year generally added little to our "culture" and little that remained to our stores of factual knowledge or to our understanding. The most one can say of it that it was over in only one year.

The value of this year to the University was that the scholastic standings served as a partial basis for admission of the students to first-year Medicine. It was an expensive and difficult way to strain the "select sixty" from those more unfortunate whose application was refused.

It would seem that this wasteful method of selection could be improved, and the course bettered. The old two-year pre-med course has been enlarged to three years. If this proves to be the same as the old, only more so, compounding uselessness, it would be far better, as Dr. Hossack has suggested, to add the additional year on to the end of the medical course, rather than to the beginning of pre-med. If it is felt that the pre-med course

must be expanded, an alternative is to demand that the applicant have a general degree in arts or science, with one or several pre-requisite subjects included among a number of optional subjects. But the purpose of these remarks is really to point out what almost every student regards as self-evident, that the previous pre-med course was time-wasting, intellectually stultifying, and provided only a poor, uneconomical basis upon which to judge the calibre of those desirous of entering upon the study of medicine.

### Lectures and Lecturers

Osler's views on the question of didactic lectures has been noted in Part one. About lectures, one can say that the important subjects are brought to the attention of the student some time or other, in a more or less ordered fashion. But is it any wonder, with the vast amount of material to be covered, that the lecturer almost invariably begins the lecture with the words, "Well, I have three lectures to cover the disease of the ——— system. Of course, we can't do more than touch on the highlights, and we'll have to hurry." This initiates three hours of frantic attempts to cover the particular field. Of necessity, much is left untouched and still virginal. The end result is the accumulation of mountains of notes, most of which will never be looked at again.

One partial solution to the problem of covering the material in the courses might be found in a scheme such as the following. The lecturer would announce the week before, on the bulletin board, that the three lectures he would give on the specified dates would be on a certain subject. He would list the pages in the texts that should be read beforehand, including refresher pages in the anatomy and physiology texts. References to recent reviews could also be listed. It would then be up to the student to read up the subject ahead of time. At the lecture, a brief printed survey of the field could be given. Slides could be shown, and patients presented during the lecture (as Dr. G. Adamson recently did in a most vivid fashion in his lecture on Huntington's Chorea). Then, in addition to one-half the time being spent on the survey, lantern slide presentation, and demonstration of patients the other half of the time should be allocated to discussion and questioning, by lecturer and students. Such a system, if carried out routinely, and with enthusiasm, would do much to instil the breath of life into the lecture theatre. The lecturer could then no longer say, as Oliver Wendell Holmes once did when remarking on the effect of lecturers in an atmosphere of "rebreathed" air<sup>8</sup> "... I have seen head after head gently declining, and one pair of eyes after another emptying themselves of intelligence ... Sleep on, dear youth ..."

It should be pointed out that many of these ideas are in evidence in some departments. This

is good evidence that such a scheme is not impossibly idealistic. To some subjects, such as medicine and surgery, it could be more easily applied than to others. The method too, relies upon the maturity of the student, and his ability and willingness to work on his own. This should eventually turn out to be of advantage, as he would early learn to use his books more thoroughly, and the discussions and criticisms would force him to be more critical than is now possible. The scheme also relies upon the willingness of the lecturer to prepare an outline, point out the reviews and the text book pages to be read, see that the slides are made illustrating the desired points, and that patients are available, when possible, on which to point out the "living" face of the disease.

An additional intriguing thought that has flitted at some time through many a student's mind has been how attractive it would be were he to sit in judgment upon the staff, instead of vice versa. Poetry has been written of such an event.<sup>8</sup> But there is more than whimsy in this turnabout picture. The professor, who voluntarily would ask his class, at the end of the course, or on occasion during the year, how the course could be improved, would receive many a thoughtful and helpful answer. From such discussions, conducted in a serious manner, and granting the maturity and good will of all participating, there could arise much of benefit to all concerned.

#### Student-Doctor Relationship

From the first formulation of the Oath of Hippocrates, there has been a close bond between the student and the master of the art. The closeness of this tie is expressed by the part of the Oath that states "I will honour as my Father the man who teaches me the Art." Osler's dedication of his textbook, *The Principles and Practice of Medicine* to his early teachers is such an expression of honour.

To perpetuate this praiseworthy state of affairs, and even to go beyond this feeling of comradeship which most students see only in clinics and labs, a practical plan has been suggested.<sup>9</sup> To students, whose problems on close-up view seem so troublesome and unsurmountable, the common-sense advice of a seasoned, well-rounded practitioner would be most steadying. Those graduates who can still recall their early days of undergraduate study may remember that all was not beer and skittles. The financial problems of a medical education, the worry of studies and exams, worry as to whether hospitals will accept one's application for internship, the question of marriage, the temptation at various and different times to break a goodly number of the ten commandments, the problems of the G.P. practice versus the siren songs of early specialism—such are the problems of the student. Dr. F. G. Ebaugh, in a recent address in Winnipeg, esti-

mated that some sixty per cent of students had problems about which they desired advice. Whatever the actual figure is, the practical usefulness of a plan for interested, easily available advice and aid should be obvious. And what could be more appropriate that the traditional student-master relationship be maintained by such a counselling plan.

The details of such a scheme would not be difficult to work out. The following rough outline might be used. First, all participation would be voluntary. The students, when admitted to the study of Medicine, would acquire what Dr. Hossack has called a godfather. The relation between the two would be a loose, friendly bond. The ambitions and the high hopes and the problems of the "adopted sons" would partly become those of the "medical godfather." In the son, the elder could recapture the spirit and enthusiasm of the novice, and by living a little more with the young, could stay young himself a little longer. From the earliest days, the student could see the problems of medicine. Ward rounds, and house calls, in the summer time, if not in the school term, would link the two. Any further relationships that would develop would depend on the participants. The benefits to all concerned would be the tangibles of friendship, comradeship, and matters of spirit generally.

The objection might be raised that the number of interested graduates would not be sufficient. That could only be found out by trying such a scheme. If not sufficient for all years, probably there would be number enough for the last two or three years, and if a doctor desired, he could be so associated with two students.

The working out of such a scheme relating "medical godfathers and adopted sons," together with the advice obtainable from other available student councillors, would go a long way toward easing some of the unnecessary mental anguish that falls to the lot of the undergraduate student.

#### Miscellaneous

Of the "physical plant" in our midst, one could say much. The crowded common room, and the inadequate canteen facilities have drawn much criticism, most of it consisting of undirected griping. The lavatories are noted for other reasons, reasons even more unpleasant, and quite prosaic. One other and very important source of complaint is the inadequate space in our library. It has been pointed out previously that a library with some thirty chairs and four tables is not large enough for a student body of some three hundred and fifty and the graduates who use its facilities. A reading room should be a *sine qua non*. If no new building were to rise up in the yards by the College, perhaps Theatre C, with its uncomfortably rigid benches with their projecting rounded eminences that run transversely across one's upper thoracic

spines, could be sacrificed, and transformed into a reading room, thereby at least doubling the present library capacity. The other Theatres are rarely if ever in use all at once, and the loss of the present benches could certainly be borne with stout-hearted equanimity.

The suggestions contained herein could be multiplied. Some of the points are minor; those relating to the lectures and lecturers, pre-med, the student's relationship with the doctors, and the library are of importance to everyone concerned. It is hoped that the suggestions made relating to these problems will be taken as representing the viewpoints of many students, made for constructive purposes. The spirit in which the student viewpoint is advanced can be succinctly expressed by a quote of Osler's, on the relation of the teacher to the student.<sup>2</sup>

"When a simple, earnest spirit animates a college, there is no appreciable interval between the teacher and the taught—both are in the same class, the one a little more advanced than the other. So animated, the student feels that he has joined a family whose honour is his honour, whose welfare is his own, and whose interests should be his first consideration."

### III

One might think the first two parts of this article strangely unrelated. The common link is the teaching of medicine, past and present, and it would seem that the problems of the different generations remain similar. Osler's thoughts on teaching, coming from one of the most successful clinical teachers, and the suggestions on teaching, with addenda, that are herein gathered together, representing the thoughts of many students, belong together. Just as teacher and student may not be divorced the one from the other, so their viewpoints on teaching and learning should be as one.

Though the student must need be the one who learns the established facts, and it is hoped, learns to think, yet there is some room for him to teach the teacher. The student suggestions provide a fertile but unploughed field with value to those who will cultivate it, and the crop from this field, depending upon the cultivator, might well contain much food for thought.

#### References

1. Flexner, S. and Flexner, J. T.—William Henry Welch, and the Heroic Age of American Medicine. New York, The Viking Press, 1941.
2. Camac, C. N. B.—Counsels and Ideals, From the Writings of William Osler, 2nd ed., Boston and New York, Houghton Mifflin Company, 1921.
3. Osler, W.—Aequanimitas and Other Addresses, Philadelphia, P. Blakiston and Co., 1905. From the address After Twenty-Five Years.
4. Ibid.—From the address, Teacher and Student.
5. Ibid.
6. Student Opinion, University of Manitoba Med. J., XX, 39-44, 1948.
7. Hossack, J. C.—Editorial. Manitoba Medical Review, XXVIII, 269-271, 1948.
8. Tilton, E. M.—Amiable Autocrat, A Biography of Dr. Oliver Wendell Holmes. New York, Henry Schuman, 1947.
8. Hossack, J. C.—Why Not Godfathers? Editorial, Manitoba Medical Review, XXVIII, 157-158, 1948.

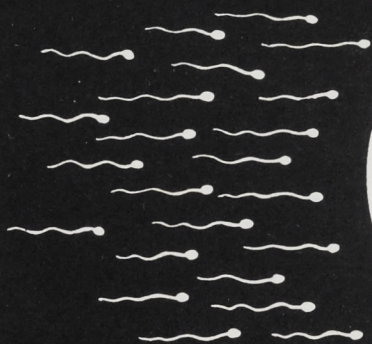
## GUEST EDITORIAL

Arnold Rogers, Editor-in-Chief, U.M.M.J.

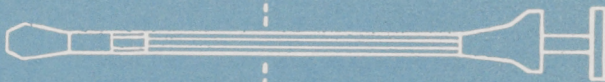
Though many of the doctors in Manitoba receive the University of Manitoba Medical Journal, the students' Journal of the Manitoba Medical Students' Association, it was thought that the remaining doctors of the province might be curious as to the type and quality of material that the undergraduates are producing. So thanks to Dr. Hossack, we were given the privilege of having some of our own articles printed in this number of the Manitoba Medical Review.

The occasion of writing this guest editorial affords an opportunity to discuss a subject that has given rise to some thought among the students, the subject of non-repayable undergraduate scholarships. For scholastic achievement in the undergraduate years, there are available at present two Isbister Scholarships for each year, plus a few prizes, medals, and other awards. The first Isbister is valued at one hundred dollars, about one-fourth of the yearly cost of tuition alone. With the present-day cost of tuition, books, and instruments, it would seem that the monetary value of scholarships might well be increased if some source of funds were available. It has been suggested that the incoming student council at the Medical College investigate ways and means of founding some type of scholarship fund for scholastic attainments, to supplement the meagre resources presently available. In co-operation with the College of Physicians and Surgeons of Manitoba, the staff of the Medical College, and the various medical societies in the province, several schemes might be considered. Two suggested sources of revenue have been advanced. The first could be called the Physician's Fund for Medical Student Scholarships. Each doctor in Manitoba, and each Manitoba graduate elsewhere, would be asked voluntarily to contribute a certain sum to a fund. Only twenty-five dollars apiece from the more than seven hundred practitioners in the province would make a marvellous beginning. Many would consider it an honour and a privilege, which indeed it is, to donate more. A second type of scholarship, donated, or bequeathed in memory of individual doctors, could also aid the students of future years, and serve to keep the names of many distinguished physicians and surgeons of this province from the oblivion of the passing years. Ideally, both the fund and the individual memorial scholarships would be self-perpetuating, using the yearly interest for the scholarships. By some or other such plan, considered and put into action by the various groups mentioned before, a great deal of good could be done for those students yet to begin their study of the art.

# Simplicity



When the use of an occlusive diaphragm is not feasible anatomically, or is rejected by the patient, a simple method of high effectiveness is the intravaginal application of Ortho-Gynol vaginal jelly.<sup>1</sup> Deposited high in the vagina with the Ortho applicator, Ortho-Gynol, by its optimal viscosity, adhesiveness and surface tension, spreads uniformly as a clinging layer over the vaginal mucosa and cervix; thereby producing an effective barrier. Involving a minimum of manipulation, this dependable method is readily acceptable to patients for reasons of simplicity.



*whenever indicated—wherever prescribed*



**ortho-gynol**

Ricinoleic acid 0.75%, boric acid 3.0%  
and oxyquinoline sulphate 0.025%

Bibliography: 1. Ware,  
H. H. Jr.: Virginia M.  
Monthly 70:238, 1943



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# OBSTETRICS

Edited by R. Lyons, B.A., M.R.C.S., L.R.C.P., M.R.C.O.G.

## The Third Stage of Labour

From Department of Gynaecology and Obstetrics,  
Winnipeg General Hospital

A. M. Goodwin, M.D.

The third stage of labour extends from the birth of the child to the delivery of the placenta and in many ways is more important than the others. It is responsible for about 10% of maternal deaths.

### Mechanism of the Separation of the Placenta

**Retraction.** After the baby is born the uterus retracts. This diminishes the area of the placental site. Superimposed is uterine **contraction** which further diminishes the placental site and aids in separation. Retraction is permanent but contraction intermittent. At the same time there is a rush of blood into the site between the uterine wall and the placenta. This blood is forced like a fluid wedge between the layers, separating the placenta in the natural line of cleavage. Since the placenta is more adherent at the edges, the haemorrhage behind it will lift up the centre, this is the "retroplacental haematoma." If at this time manipulation is too brusque, the edge of the placenta may separate at one place allowing the retroplacental blood to escape.

It is doubtful which of these mechanisms is the most important factor in placental separation; probably retraction and contraction take precedence over the retroplacental haematoma, which, in the opinion of most present day authorities, plays very little part in the actual separation of the placenta.

**Expulsion.** When the placenta is completely separated, or nearly so, uterine contractions force it against the internal os, and finally through it, into the upper vagina. From this point, abdominal muscles take on some of the work and complete the delivery. The common method is that the placenta turns inside out like an umbrella, the foetal surface being delivered first with the cord leading the way, and the membranes following, containing the retro-placental haematoma. This is "Schultz's" mechanism. In the "Duncan" mechanism, the lower edge of the placenta comes first, the whole organ sliding down the uterus into the vagina. The membranes are then mechanically drawn off the wall by the descending placenta, aided somewhat by retraction and contraction. Haemorrhage from the large sinuses of the placental site is controlled at this moment by retraction of the uterine muscle fibres. These act like living ligatures on a thin walled vessel. The **shifting** of the muscle layers, and shortening of the bundles

of fibres **displace, compress,** and then twist the thin walled vessels so that they are no longer patent. Also, small thrombi form in the mouths of the sinuses thereby assisting in checking the flow.

Immediately after the child is born the fundus is seen and felt as a large, soft mass, flattened antero-posteriorly and reaching to the umbilicus. It is broad from side to side and not particularly mobile. After the placenta reaches the vagina, the uterus rises higher in the abdomen, usually to the right side, and becomes very mobile from side to side. A soft, boggy mass appears above the pubis (the placenta). The uterus becomes hard and globular and finally sinks lower in the abdomen.

When posterior pituitary extract and ergot preparations are given during the late second stage of labour, this whole process is hastened. The fundus does not rise high towards the liver, and instead of a period of rest following the birth of the baby, the uterus is immediately contracted, squeezing off the placenta and expelling it at once into the vagina.

### The Management of Normal Third Stage

It has been said that the third stage should be "watched" and not "managed." A better term would be "The management of the accoucheur during the third stage of labour."

After the delivery of the baby the accoucheur should himself **guard** the uterus or delegate the task to an experienced hand. No massage should be practised. The hand simply rests on the fundus and observes its consistency, shape and size. One will then become aware of the uterus that has a tendency to fill with blood. This may, in some measure, be controlled by holding the uterus firmly. If there is external bleeding, and the uterus softens and fills up, it is permissible to practice gentle massage and firm pressure but not kneading the uterus. The accoucheur then waits until the placenta has been separated and expelled into the dilated lower uterine segment and upper vagina. Some of the signs of placental separation have already been outlined; in addition it will be observed that: (1) The cord outside the vulva lengthens. (2) There may be a small gush of blood. (3) On gently pushing the fundus down, the cord outside the vulva lengthens and does not withdraw into the vagina when the pressure is released.

When the placenta is separated and lies in the lower uterine segment or vagina, it may safely be expressed by using the uterus as a piston, **during contraction only.** Depress the uterus downwards and backwards—always gently. Provided one is sure that separation is complete, delivery may be

assisted by lifting on the cord rather than forcing the cervix **down to the vulva**. Before attempting to express the placenta from the vagina, be sure the bladder is empty; catheterize if necessary. Be sure the uterus is in firm contraction, and in the mid-line. Avoid too firm squeezing of the uterus. The cervix should not be pushed down to the vulva because the danger of infection is thus greatly increased and the fundus cannot then be massaged satisfactorily through the abdomen. Do not leave off guarding the uterus until it is hard, fully retracted and with no further bleeding.

Examine the placenta and membranes. If the membranes appear deficient do nothing about it, they usually come away later without trouble. If a cotyledon is definitely missing and bleeding is abnormal, the uterus should be explored. When in doubt about a missing cotyledon, and bleeding is absent it is best not to explore the uterus.

In examining the placenta, appraise the maternal surface first, especially the edge. Following this, examine the foetal surface, and trace the blood vessels. Each must end in placental tissue. A vessel traced off the edge where no cotyledon is present suggests a portion is missing, or even the presence of a succenturiate lobe.

After the placenta is born posterior pituitary extract or an ergot preparation, or both, may be given; this maintains tone in the uterine muscle.

The patient should not be left until at least one hour following the third stage. During this time the obstetrician or other responsible person should constantly guard the fundus, watch for bleeding, and frequently check the pulse. An ice bag over the fundus seems to have some virtue in maintaining uterine contraction. Avoid vigorous squeezing of the uterus at this time also, and do not be too anxious to force out blood clot, for in doing so you also milk out the thrombi from the mouths of the sinuses causing the uterus again to fill with blood. By constant guarding of the uterus before and after the placenta has been expelled, the formation of large clots within the uterus will not have taken place.

During the third stage of labour, it is important to guard against two temptations: (1) Do not knead the fundus during relaxation, as this may set up irregular contractions that will produce partial separation of the placenta. This is a common cause of post-partum haemorrhage. Vigorous kneading also may cause mashing of the soft placenta to a pulpy mass, thus rendering fragments more liable to retention within the uterus. (2) Do not vigorously squeeze the uterus during its contraction. The body of the uterus is richly innervated by the autonomic nervous system, and this manoeuvre may cause shock. Unnecessary manipulation, plus bleeding, will put a patient into shock rather quickly on occasions.

On moving the patient or turning her from side to side at this stage, be certain that the uterus is firm, and that her thighs are kept firmly pressed together. These precautions are probably important in the prevention of air embolism, which does occur occasionally.

After the placenta is delivered, or even before, the birth canal must be inspected for damage. If the placenta is not separating readily the accoucheur may well keep himself occupied in carrying out any repair necessary at this time. He will often find that when this is completed the placenta will be ready to come away. It cannot be stated dogmatically whether the perineum should be sutured before or after the birth of the placenta for every case will be decided at the time. Nothing should be allowed to interfere with the guarding of the fundus; suture of the perineum is of secondary importance. It must be remembered, however, that blood loss from the episiotomy wound may be considerable and of especial importance in a woman already depleted of blood. A clamp or two on the vessels will usually control the bleeding meanwhile, or a hot gauze sponge may be firmly pressed into the wound.

It has become recent practice to assure slow delivery of the body of the baby. This seems to favour the normal separation of the placenta. The procedure of Dieckmann is as follows: After the delivery of the anterior shoulder, a pause of 30 seconds or more is allowed before delivering the posterior shoulder. Then 0.1 ml. of posterior pituitary extract solution is given or, if preferred, 0.4 mg. of ergotrate intravenously. A second pause of 30 to 60 seconds is followed with slow delivery of the body. The average time for this part of the delivery, with the patient anaesthetized, is from 3½ to 4½ minutes. Post partum haemorrhage is said to be much lessened. Haemorrhage of 300 cc's or more is unusual, and Dieckmann claims that haemorrhage of 500 cc's or more will be practically eliminated.

Where no oxytocic was used the amount of blood lost with the placenta was slightly increased, and the blood loss after expulsion of the placenta was definitely increased. Therefore, Dieckmann considers that the anaesthetized patient must be given an oxytocic.

Dieckmann states that all placentae should separate almost at once when the above procedure is adopted for the late second stage of labour. He further states that the placenta should be delivered manually if not away in one hour, and usually within 15 minutes.

The above procedure appears to have some merit, but I have not been in the habit of giving pituitary extract intravenously, and would hesitate to do so. Ergot preparations given intravenously have been found efficacious, but in not a few cases have I found the cervix to contract down and cause

the placenta to be retained after its use in this manner.

From the above remarks it will be seen that the management of the third stage of labour begins in the late second stage.

Having dealt with the mechanism and management of the normal third stage of labour, we proceeded to the consideration of some of its **complications** as follows:

- (1) Retained placenta and placenta accreta.
- (2) Haemorrhage.
- (3) Lacerations of the birth canal.
- (4) Shock.
- (5) Inversion of the uterus.

Complications are all too frequent, always serious, and very often unjustifiable. They are more prevalent, and cause more deaths than those of the other two stages combined.

### Retained Placenta

The retention of the completely separated placenta may result from any constriction or obstruction in the birth canal, most commonly some type of hour-glass constriction, a tetanic constriction at the junction of the upper and lower uterine segments.

This may follow the injudicious use of oxytocic drugs during the second stage of labour, or from too vigorous and too early massage of the fundus. In other words, from unjustifiable interference with the normal progress of the third stage of labour. The separated placenta remains trapped in the upper segment, with resulting profuse haemorrhage.

Frequently a placenta may be retained by a distended bladder, which presses on the cervix, causing a mechanical obstruction in the birth canal.

Retention or partial separation of the placenta is common in the atonic uterus. This follows prolonged and difficult labour, or a short but violent one; a phenomenon universally witnessed when a second stage labour is whipped into furious activity by oxytocics. (The use of posterior pituitary extract in the second stage of labour, surely has few advocates in this generation). There is a resulting fatigue and hopeless relaxation of the myometrium. The uterus responds poorly to oxytocics and to massage. It is soft and boggy, rises steadily in the abdomen, and any contraction is followed by a sudden gush of blood which, in turn, may result in varying degrees of shock.

Other causes may be over-distension of the uterus as in polyhydramnios or multiple pregnancy, prolonged anaesthesia for difficult delivery, or for repair of extensive lacerations. Probably the greater use of local anaesthetics should be encouraged.

A placenta may be retained without haemorrhage occurring as in cases of constriction ring,

placenta accreta and uterine atony. Sheehan of the Rotunda Hospital, in 1947, described 35 cases of fatal shock in women in whom the placenta had been retained, with little or no haemorrhage.

### Management of Retained Placenta

If the first attempt at expression of the uterus does not bring the placenta, an error in judgment has been made, the placenta has not separated, and one must wait for more definite signs to appear when simple expression is repeated.

In the absence of bleeding there is no immediate danger, and one may safely wait. If after an hour, the placenta fails to come, this indicates that normal separation has not occurred, and that we are now dealing with a pathological condition.

At this point one Credé manoeuvre is permissible. This manoeuvre differs from the simple form of expulsion of the placenta from the vagina, and is purposely used where the placenta is still within the uterus. The uterus is squeezed so that its contents are expelled like a cherry stone. Again, the bladder must be empty, the patient anaesthetized, and pressure exerted only during a contraction. If unsuccessful, a second try at this manoeuvre is permissible after a waiting period. If it again fails manual removal of the placenta is indicated. Persistent bleeding, however, calls for earlier manual removal of the placenta.

Formerly it was the custom to wait many hours for the placenta to separate, but with present day antisepsis, chemo-therapy and antibiotics it is safer to remove the placenta earlier. There is more danger in intra-uterine manipulation even two hours after delivery than at an earlier hour.

### Placenta Accreta

Placenta accreta is not only an abnormality of separation, but also one of implantation. "The etiology seems to be a defect in the decidua resulting from scarring of the endometrium." (Novak). Normal separation through such areas is impossible. The cause may be chronic infection or a previous severe curettage. Normally separation of the placenta occurs through the spongy layer of the decidua. In placenta accreta the chorionic villi penetrate the myometrium to varying depths.

The incidence of placenta accreta is stated to vary from 1:14,000 to 1:24,000 deliveries. The symptoms are those of a prolonged third stage usually with haemorrhage. The diagnosis is made after Credé manoeuvre has failed, and when a cleavage plane cannot be found on attempted manual removal of the placenta. If no plane is found, further attempts are dangerous, the finger may easily dissect through the thinned out musculature and find its way through the uterus. At this point the recognized form of treatment is immediate hysterectomy after blood loss has been replaced. Prophylactic sulfonamide and penicillin should be given. Recent cases are recorded when

the placenta has been left alone and gradual absorption has taken place. This form of treatment may receive further attention in the future.

### Haemorrhage

Haemorrhage accounts for 30% of maternal deaths. Haemorrhage in the third stage of labour arises from two sources: (1) From the uterine cavity, and (2) from lacerations in the birth canal. The former results from a partially separated placenta, retention of a completely separated placenta, hour-glass constriction of the uterus, atonic uterus, placenta accreta, distended bladder, and deep anaesthesia. A partially separated placenta usually results from the failure of the obstetrician to await typical signs of complete placental separation and hence making attempts at delivery too early. A common sin is too vigorous massage of the fundus with the resulting profound uterine contraction followed by muscular fatigue, relaxation and haemorrhage. A uterus fatigued from any cause may bleed. It is therefore logical to expect, and be prepared for excessive bleeding in any case of prolonged or obstructed labour, multiple pregnancy, poly hydramnios or uterine inertia.

Adherent placental fragments usually are accompanied by bleeding which may occasionally be delayed for days.

Haemorrhage from an atonic uterus may not begin immediately after the placenta is delivered but usually starts a short time afterwards. There is a steady stream of blood from the vagina. Meanwhile the uterine cavity fills with blood, which may be expressed as clots only to be followed again by a steady trickle of blood from the vagina. Shock and collapse may follow.

Of all forms of post-partum haemorrhage the most treacherous is that which comes in spurts, or as small clots with apparent cessation of bleeding between times. The uterus responds to massage, a clot may be expressed, and all the bleeding stop. But after a moment the uterus will relax again with more bleeding which, again, is checked by massage of the fundus. The patient may pass into shock before the seriousness of the situation is appreciated by the operator. Posterior pituitary extract and ergotrate may not have the desired effect. Radical interference may be delayed until too late.

Intermittent spurts or trickling of blood prior to the delivery of the placenta is an indication that the placenta is either adherent or retained, and its early removal is usually indicated.

Diseases of the blood or blood vessels such as thrombopenia, scurvy, avitaminosis, chronic anaemia, sepsis and toxæmia, may all lead to haemorrhage. Here one would emphasize the importance of complete investigation of every patient during the early prenatal period, so that such abnormalities may be corrected prior to labour. The

question then arises, what is to be considered normal blood loss in labour? It is generally agreed that up to one pint is usually borne without ill effect in the healthy gravida. The average loss may be considered to be about 300 c.c. (8 to 10 ounces).

### Haemorrhage from Lacerations of the Birth Canal

This is the second most common cause of haemorrhage. The bleeding is usually continuous and the uterus is well contracted. Careful examination will discover the source. Lacerations of the clitoris and of the bulbi may cause alarming haemorrhage. Haemorrhage from a ruptured vulvar varix is rare, although the presence of varices is relatively common. Perineal and vaginal tears are rarely attended with dangerous bleeding although episiotomy wounds may bleed profusely. Bleeding from vaginal tears can usually be controlled by simple packing; sutures are difficult to place on account of the area being inundated with blood.

Deep cervical tears often give rise to serious haemorrhage. Forcing delivery of the baby's body through a contraction ring may produce a tear to the edge of the contraction ring. Here the tear is likely to be a longitudinal split of the cervical wall, extending into the broad ligament. Any further extension of such a tear would represent a rupture of the uterus, incomplete or complete, depending upon whether or not the peritoneal cavity has been opened. Undoubtedly many cases of so called "post partum haemorrhage" and "shock" are in reality cases of uterine rupture.

On rare occasions one may be obliged to perform delivery through an incompletely dilated cervix. In all such cases the cervix must be examined after the third stage is completed. Lacerations of the cervix and lower uterine segment in cases of placenta praevia bleed profusely, owing to the great vascularization of the lower segment and cervix due to the placental implantation. The veins and sinuses are situated so close to the surface that a tear even one-eighth of an inch in depth may produce uncontrollable haemorrhage.

### Symptoms of Haemorrhage

The characteristic symptoms of gross blood loss in the parturient woman are well known to all. They are: Faintness, dizziness, air hunger, yawning, restlessness, thirst, a feeling of weight in the chest and smothering, a fear of impending death, vomiting and collapse and occasionally convulsive twitching in the final stages. The pallid face with pale blue lips, a nose and forehead covered with beads of perspiration, form a picture once seen never forgotten. Respirations are rapid and shallow, the blood pressure low, the pulse fast and feeble and finally gone from the wrist.

### Treatment of Haemorrhage of the Third Stage of Labour

Haemorrhage having occurred following the delivery of the child, the first move is to grasp the uterus and massage it evenly with gentle firmness. Then 1 c.c. ergometrine (or 1/320 gr. of ergotrate) and 1 c.c. posterior pituitary extract are given intramuscularly. The ergotrate may be given intravenously. At the same time inspect the birth canal for injury. If bleeding continues, it becomes necessary to remove the placenta at once, but first one attempt at expression by the Credé manoeuvre is carried out, squeezing the uterus only during a contraction and with the bladder empty. If bleeding does not stop, have the patient anaesthetized and try the Credé manoeuvre once more. If this fails, change the gown and gloves, wash off the patient and remove the placenta manually. A hot intrauterine douche, or intrauterine pack finds favour with some obstetricians in this emergency.

A few details of the **operation of manual removal of the placenta** may be worthy of elaboration:

- (1) The bladder should be empty.
- (2) The patient should be anaesthetized.
- (3) Strictest aseptic technique must be followed.
- (4) The fundus must be controlled by the "abdominal hand."
- (5) The membranes should be penetrated next to the placenta.
- (6) The cleavage plane should be cautiously found and followed by the fingers until every portion is dissected away in one piece by working from the fundus down by a motion of the fingers parallel to the uterine wall.
- (7) Do not force a cleavage plane. Always remember the rare possibility of placenta accreta.
- (8) The separated placenta should be grasped in the hand and forced downward by the fingers along the wrist aided by traction on the cord.
- (9) The placenta is thus delivered along the wrist without removing the hand from the uterus.
- (10) Further oxytocic drugs may be given at this point.
- (11) The intrauterine fingers now explore the entire uterine wall for any remaining fragments, and at the same time the external hand carries out gentle massage to the fundus.
- (12) When the uterus is satisfactorily emptied and contracting, the hand is forced out together with the handful of blood clot present in the uterus and vagina.

(13) Guarding of the fundus is continued.

(14) Penicillin may be given prophylactically, as well as sulfonamides.

(15) Haemorrhage and shock should be appropriately treated, "Blood for bleeding, Plasma for shock."

(16) At this point many renowned obstetricians advise the use of an intra-uterine pack, and others recommend the use of the hot intra-uterine douche, referred to above. Neither of these procedures have I resorted to. The hot douche will probably not be available when needed, and does carry some risks. I am not convinced that the intra uterine pack is of any value. It seems illogical to fill the uterine cavity with gauze and expect this to control the bleeding when the uterus is really like a distensible balloon. I maintain that this large mass of foreign material within the uterus will serve only to keep the uterine sinuses open and further prevent, rather than encourage uterine contraction and retraction.

When haemorrhage is alarming and persists after removal of the placenta and where the uterus still fails to contract, the manoeuvre described by Hamilton many years ago will be found very useful. The closed fist is placed within the vagina below the uterus. The uterus is then vigorously massaged through the abdomen, while at the same time the intravaginal fist is rotated back and forth against the uterus below.

A tight vaginal pack accompanied by firm pressure upon, and massage of, the fundus is recommended by some authorities, and in alarming cases may have a good effect. Hysterectomy may be required as a last resort in the extreme case.

### Obstetrical Shock

"Shock is a circulatory deficiency, neither cardiac nor vasomotor in origin, characterized by decreased blood volume, decreased cardiac output (reduced volume flow), and by increased concentration of the blood." (Moon).

There is also possible some chemical toxin formed in damaged tissues (crush syndrome), which when absorbed injures the capillaries causing increased capillary permeability.

In obstetrics, shock is usually due to blood loss and is therefore largely preventable. A few of the other contributing factors are deep anaesthesia, prolonged or damaging delivery with forcible dilatation of the cervix, pulmonary embolus and vigorous squeezing of the uterus to express the placenta.

The clinical picture resembles closely that described under haemorrhage.

Sage and Brown tabulate the differential diagnosis between true obstetrical shock and haemorrhage as follows:

	Haemorrhage	Shock
Onset	Late, abrupt	Early, insidious
R.B.C.	Normal, followed by drop	Increased, hemo-concentration
Reaction	Alert, apprehensive	Drowsy
Pulse	Full-bounding, regular	Feeble, uneven
B.P.	Normal until late	Gradual drop
Respiration	Rapid and deep	Shallow, sighing, irregular
G.I. Tract	No change	Nausea and vomiting

(This chart depicts haemorrhage in its early phase).

As in haemorrhage, prophylaxis is the best treatment for shock. The more general use of local anaesthesia for episiotomy and repair is good practise. The support of the patient in a long first stage of labour is all too often neglected. The timely administration of intravenous glucose solution is important, and adequate rest periods must be assured by properly selected sedatives and analgesics. No less important is a sympathetic understanding on the part of the obstetrician to allay the great fear present in so many women in the throes of labour.

Active treatment should be started with the first sign of impending maternal distress.

- (1) Elevate the foot of the bed.
- (2) External heat to maintain body temperature. Heat should not be so great as to produce severe diaphoresis with consequent loss of salt and body fluids.
- (3) Oxygen administration.
- (4) Sedatives to allay pain and restlessness, morphine is the drug of choice.
- (5) Replacement therapy is of all treatments the most important. Where haemorrhage has been responsible, **transfusion with blood is the treatment.** Plasma may be started immediately, and its administration may be continued until properly matched blood is available. In combatting toxic or reflex shock hypertonic glucose solution (25-50%) intravenously should be started immediately. Plasma may be substituted, but blood is indicated only if there has been blood loss, or whole blood is used to counteract an anemia.
- (6) When definite hemo-concentration is present, as proved by red cell count, there is evidence of increased capillary permeability, and in this condition intravenous administration of plasma is of most value. When plasma is not available a 6% solution of gum acacia in saline may be substituted. To prevent overloading the circulation and putting added strain on the myocardium during intravenous therapy, frequent blood pressure readings, and pulse rate determinations should be recorded.
- (7) Adrenalin, ephedrine, caffeine, digitalis and coramine are of no use in combatting obstetrical shock.

### Inversion of the Uterus

This is a rare accident of labour, occurring about once in 10,000 deliveries. It is due to the invagination of the fundus of the uterus after the delivery of the foetus. The process tends to progress until

the entire uterus may become turned inside out so that it forms a tumor lying in the vagina.

The causes of inversion are a matter for argument, but an atonic state of the uterine muscle is necessary for inversion to occur. It is possible that mismanagement of the third stage, kneading and traction on the cord may be all that is necessary to complete the act. Inversion may occur before or after the birth of the placenta. It may happen suddenly and is then called "acute inversion," the prominent clinical symptom being "profound shock." Haemorrhage is not frequently an outstanding feature.

Occasionally the inversion may occur more slowly and may not be discovered until a vaginal examination is made some days or weeks following delivery. There may be little constitutional disturbance. This type is called "sub-acute or chronic inversion."

The diagnosis is made by vaginal examination; abdominal palpitation may or may not reveal the dimple on the fundus. In complete inversion the vagina is occupied by a large soft tumor, and it is not possible to reach the cervix.

In the sub-acute and chronic inversion, persistent bleeding in the puerperium will indicate the need for vaginal examination.

### Treatment of Uterine Inversion

In acute inversion, first treat the shock and haemorrhage as described previously under these headings. It was estimated that 30% of cases died when re-position was attempted in the presence of shock.

If the placenta has not been delivered, no attempt is made to detach it from the inverted fundus. After a few hours (6 to 24), when the general condition has improved, the patient is anaesthetized, and an antiseptic vaginal douche is given. The attached placenta is removed, the inversion reduced by gentle pressure with the fingers in the vagina. Usually if this treatment is carried out within 24 hours, there is no great difficulty, but if some days have elapsed the cervix may be so constricted that it is found impossible to replace the fundus.

If the above manipulation fails, an Aveling's repositor may be inserted, and the patient left alone for a period of 24 hours or more. The uterus will then be found replaced in the majority of cases. (The Aveling's repositor resembles the stem pessary attached to four elastic bands, fixed to a belt around the waist). The danger of infection is great, and all methods to combat it must be brought into use.

One may encounter the very rare case where there is no response to treatment for shock after

an hour or more. Here one may be justified in attempting replacement of the uterus. Kellogg advises laparotomy for replacement of the subacute and chronic types of uterine inversion, and he has many supporters.

Subsequent deliveries should be done by Caesarean section. The death rate is placed at 40%.

#### References

1. De Lee, Principles and Practice of Obstetrics, 7th Ed.
2. Gibberd, Short Textbook of Midwifery, 4th Ed.
3. Davis, Carl Henry, Gynaecology and Obstetrics, W. F. Prior Co., Inc.
4. Titus, Management of Obstetrical Difficulties, 3rd Ed. 1946.
5. Eastman, Nicholson J., Editorial Notes in Obstetrical and Gynaecological Survey, Vol. 2 and Vol. 3.
6. Dieckmann et al, Am. J. Obs. & Gyn., Sept., 1947.
7. Novak, Emil, Gynaecological and Obstetrical Pathology 2nd Ed., 1947.

## CANCER

Edited by D. W. Penner, M.D.

### Abstract

Howson, John Y., Observations on the Delay Period in the Diagnosis of Pelvic Cancer, The Medical Clinics of North America, Philadelphia Number, 1948, W. B. Saunders Co., Philadelphia.

There has been considerable written on the delays in the diagnosis of cancer with their implications. Most authors divide delays into those due to the neglect by the patient and those due to the neglect by the physician. The author of this article summarizes the analysis of 1,000 cases of pelvic cancer. Possibly the most interesting general observation made is the fact that the average delays were longest (27 months) in carcinoma of the vulva, whereas, in carcinoma of the ovary the period was 11.2 months. Plainly this delay is not due to the inaccessibility of the lesion. The important contribution of this author is the analysis of the factors concerned in the physicians' delay with constructive suggestions for improvement. The first of these is incorrect diagnosis. Obviously the ability to make a correct diagnosis depends upon the training and experience of the examiner. As well as this, it is realized that nobody is infallible. The second, and by far the most important, was the failure to do a pelvic examination in the presence of pelvic symptoms. This occurred in more than 50% of the cases under discussion. Failure to make a pelvic examination in the presence of pelvic complaints is a most serious omission. The various reasons for this failure were given as:

(1) The presence of active vaginal bleeding: This, in the opinion of the author, was no medical reason for not examining the patient. Furthermore, examination at this time would more readily divulge the source of bleeding.

(2) Indiscriminate use of medications: In many cases the pelvic symptoms were treated without

any attempt at diagnosis. Vaginal discharges are often treated by douches with a warning to the patient to return for pelvic examination if the symptoms do not abate.

(3) Failure to examine at first office visit: Regardless of the considerations concerned at the first visit it would seem advisable if the symptoms warrant it to do a complete examination.

(4) Patient unprepared for pelvic examination: If the patient insists that she is unprepared definite appointment should be made for a subsequent follow-up appointment.

(5) Symptoms indicative of menopause: Only too often reassurance to the patient that her complaints are due to the change of life is made. Willingness to ascribe any symptoms between the ages of 40-45 as due to the menopause is far too common. This and the prescription of hormone therapy without adequate examination or diagnosis is to be strongly condemned.

(6) Patients visited at home: Deferment of pelvic examination on this basis is common practice. In certain instances it would appear advisable to refer the patient to the office for a proper pelvic examination. Pelvic examinations at home would in some instances, however, prevent the possibility of unnecessary delay.

It is important that the pelvic examination be complete. This includes the use of bimanual and adequate visual examination.

D. W. P.

### REMEMBER

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# ANAESTHESIOLOGY

Edited by R. G. Whitehead, M.D.

## Management of Post-Operative Pulmonary Complications

Of all the complications that beset the surgeon, those involving the lungs are among the most common. These complications, marking the difference between success and failure of an operation have led to more intelligent efforts in their reduction by better pre-operative preparation, improvement in anaesthetics and their administration, meticulous care in the elimination of operative trauma and close attention to the patient throughout the convalescent period.

Numerous etiological factors have been held responsible for pulmonary lesions following operation. The views commonly supported are: (1) that anaesthesia with aspiration of infected material is the cause of most pulmonary complications and (2) that emboli, either sterile or infected are responsible. Other factors such as decreased respiratory excursions, abolition of cough reflex, and lowered resistance must also be considered.

It has been claimed that atelectasis is the basis of post-operative pulmonary complications. Following abdominal operations, the absence of deep diaphragmatic breathing rapidly brings about absorption of the alveolar air and collapse of the lower lobes. Limitation of respiration by position or tight abdominal binders and abolition of the cough reflex predisposes to atelectasis. These conditions hasten accumulation of mucous and plugging of bronchi with absorption of alveolar air. The stage being thus set, invasion by bacteria will cause varying degrees of infection.

Regardless of their etiology post-operative pulmonary complications bear a striking similarity in their mode of onset and physical characteristics. Usually within 48 hours there is a rapid rise of temperature of 102-104 degrees with increased pulse and respiration. The patient may complain of cough, malaise or pain in the chest. Physical findings may reveal rales at the lung bases and a diagnosis of bronchitis may be made. The process may progress with a further rise in pulse and respiration and X-rays may show an area of consolidation with physical findings those of lobular pneumonia. The continuation of this infectious process, particularly if infarction is present will lead to abscess or gangrene.

Massive collapse of a lobe or lung with consequent displacement of mediastinal organs towards the side of the lesion must be considered as a pathological entity not to be confused with pneumonia or pleural effusion.

Recognizing the factors involved, prophylactic measures should head attempts at treatment. In general, these are intended (1) to prevent infection of the lungs by bacteria, (2) to minimize circulation of emboli and their implantation in the lungs, (3) to prevent atelectasis, (4) to prevent shock or other factors whose depressing effects lower the resistance of the patient.

Should definite pneumonia develop, the treatment is no different from that uncomplicated by an operation.

Should atelectasis develop, the patient is rolled back and forth on the uninvolved side and encouraged to cough. To aid the coughing-up of tough secretions, cocaineizing the throat is recommended by one author (Grandstaff). A 5%-10% cocaine solution in a cotton plug held on a curved applicator is placed far back in the throat and into the pyriform sinuses. The use of the procedure apparently relaxes the musculature of the bronchial tree and in a few minutes the patient will cough up a large plug of mucous and be relieved at once. Use of a little epinephrin in the same solution will help stimulate the cough reflex. Merely using the cotton plug will not produce the desired effect. Failure to cough up the offending mucous plugs or when the co-operation of the patient is not to be had, bronchoscopy is the measure most likely to be attended by success. During the next 24 hours, or more, use of intermittent inhalation of carbon dioxide and oxygen is continued. Penicillin is administered to prevent onset of pneumonia in the congested and airless region. The patient is rolled from side to side frequently and made to cough and take deep breaths. A set of blow bottles may be devised so that the patient can blow water from one bottle to the other every hour, this helps to increase and maintain expansion of lung tissue.

The use of intercostal nerve blocks has recently been described as treatment for cases threatening to develop atelectasis. It relieves incisional pain, allowing the patient to breathe more deeply and to cough without discomfort. Blocking of these nerves stops the reflex which would otherwise maintain the collapse. In most patients it was found necessary to repeat the blocks at daily intervals for the first 2 or 3 days.

Pulmonary embolism requires immediate emergency treatment and the recognition of early signs and symptoms should be stressed to the nursing staffs. At St. Luke's Hospital, the following is the routine. The nurse (1) places the patient in a semi-sitting position, (2) starts oxygen immediately, (3) gives 1/75 grain atropine sulfate hypodermically,

(4) calls the interne. The interne administers a second dose of atropine grains 1/60-1/75 I.V. if previous injection had not caused flushing of face or dilatation of the pupils, (2) gives ½ grain papaverine hydrochloride I.V. in any case, (3) repeats papaverine and atropine 3-4 times a day, (4) orders a portable chest film and electrocardiogram.

The rationale of this treatment is based on the assumption that a wide-spread radiation of autonomic reflexes occurs during embolism which effect the heart, the pulmonary vascular tree, the bronchi and the gastrointestinal tract. These reflexes are predominately vagal and produce spasm of the smooth muscles, thus the use of atropine and papaverine are indicated. Morphine and digitalis both sensitize the vagus and may thus facilitate such reflexes. Epinephrin, employed for the acute hypotension may lead to pulmonary edema in the presence of increased pressure in the pulmonary artery.

When a patient recovers from the initial attack, management of such cases may include anti-coagulant therapy, paravertebral sympathetic blocks, proximal venous ligations and roentgen-ray therapy.

However, the sensible approach to pulmonary embolism is prevention of phlebothrombosis. This may be accomplished through, (1) early rising, (2) by exercise, (3) Trendelenburg position to accelerate venous return from the extremities, (4) anti-coagulants, (5) prevention and correction of dehydration and circulatory collapse and (6) deep breathing to increase negative thoracic pressure and hence favor the movement of venous blood.

H. Eshoo, M.D.

#### References

- Grandstaff, E. H.: Archives of Surgery, Vol. 51, No. 4, Nov.-Dec., 1945.  
McCartney, J. S.: Surgery, Vol. 16, No. 2, Feb., 1945.

#### Abstract

Nerve Short Circuits as a Theory of Pain.\* A. L. Soresi, New York, N.Y. Anes. and Anal., Vol. 27, No. 6, Nov., Dec., 1948.

The author presents an interesting theory of the cause of pain by comparing the pain mechanism with the short circuit in electric current conduction. Pain is a pathologic sensation caused by physical alterations of nerve structures, either congenital or acquired, which allow excessive leakage of the nerve current.

Various dysfunctions inevitably follow the occurrence of nerve short circuits which may occur in psychic centres, motor efferent or sensory afferent structures. These dysfunctions are analogous to dysfunctions observed in electric structures and are due to pathologic misdirection of nerve impulses which run chaotically instead of running according to physiologic patterns. The pathologic manifestations of misdirected nerve impulses due

to short circuits obviously vary according to the functions and relations of the nerve structures whose insulation has become inadequate. They are more complex where anatomic end functional relations are most complex, as in the viscera in which afferent and efferent cerebrospinal, sympathetic and parasympathetic nerve structures assume complex interrelations and functions.

Pain is never a physiologic sensation. These sensations are elicited exclusively by peculiar nerve structures, namely, undamaged receptors specific for each modality of sensation. Pain sensation, on the contrary, is elicited by pathologic irritation of most nerve structures the normal functions of which do not include the elicitation of sensations. These nerve structures are normally protected against direct stimulation and irritations. Most modalities of pain observed in patients are due to pathologic nerve alterations (short circuits). These result from alterations of media and of normal biophysical insulation of nerve structures due to wear and tear of tissues and organs, which normally have functioned painlessly. No receptors exist in nerve trunks or ganglia and the normal function of their component is the mediation of physiologic specific sensations or the conveyance of orders from the centres. Yet their direct stimulation or irritation elicits solely pain sensation, because stimulation or irritation of nerve trunks and ganglia results in short circuits between many of their components, with consequent misdirection of impulses.

Cross nerve currents resulting in cross stimulation of nerve fibers were demonstrated by Hering in 1882. More recent contributions prove that mere alterations of the media are sufficient to cause leakage of the nerve current from nerve fibers, and that cross nerve currents, with consequent cross stimulation of nerve fibers occur under certain circumstances even in normal myelinated nerve fibers.

The following axiomatic facts should be emphasized: (1) Normal media represent not only adequate, but the essential means of physiologic insulation between the various naked nerve structures. Normal media are also essential to those nerve structures which are provided with insulating sheaths, physically comparable to the insulating sheaths surrounding electric wires. (2) Nerve current leaks out of its conductors more readily than does electric current, because inanimate electric conductors can be surrounded with means that ensure physical insulation from other conductors and from their surroundings. The biophysical insulation of nerve structures is complex and by its nature is more vulnerable than the insulation of electric structures. Therefore, leakage of nerve current will readily occur when pathologic conditions alter the media or the nerve structures.

Nerve short circuits should be considered the sole, physical cause of pain, as may be determined by properly interpreting the following experiments. (1) Leriche emphasizes that in nerves there are no receptors and that mixed nerves are composed of all varieties of sensory and motor fibres. "And yet," he states, "if one pricks a nerve outside, inside or right in the middle, one never produces anything except a violent sensation of pain." (2) Woodworth and Sherrington, by pricking the sciatic nerve of decerebrate animals provoked the same vocalization and violent disorderly contractions as provoked in normal animals. (3) If we prick a charged cable leading to an electrical apparatus, we know that short circuits occur with consequent disruption of functions.

Pain becomes effective when to the electronic apparatus represented by the decerebrate animal a normal brain is added, but evidently its physical basis (nerve short circuits and consequent dysfunctions) remains the same. Volleys of abnormal impulses started from the short circuited fibers run centrally and peripherally, and chaotically jumps to and from motor and sensory, fast and slow cerebrospinal and autonomic fibers butting against synapses and riotously bombard centres, effectors and receptors to which they are not destined. The volleys of abnormal impulses cause simultaneous disturbances of motor, sensory, circulatory and secretory structures independently of brain centres, which in the decerebrate animals

have been eliminated, and while they affect the brain centres of normal human beings and normal animals, their fundamental nature remains unchanged.

The conception that pain is caused solely by nerve short circuits explains why the most destructive surgical means often fail to control it, and why some modalities of pain are called intractable. The essential point in control of pain is the permanent abolition of all pathologic short circuits through which algogenic impulses can reach the centres. Knowledge of anatomy and physiology proves that this ideal can be reached only by blocking the spinal and other ganglia. The spinal ganglia contain the cellbodies—the vital centres—of the peripheral cerebrospinal and sympathetic afferent neurons. Consequently, their devitalization also devitalizes the sensory neurons in their entirety and their pathologic connections through which algogenic impulses might be short circuited to the centres, whether their processes are short or long. Blocking of spinal ganglia preserves all motor and visceral functions because it affects solely the afferent structures and can be effected with solutions which control pain, and allow preservation of the larger cellbodies, and consequent preservation of desirable sensation.

\* Presented before the Twenty-second Annual Congress of Anaesthetists, Joint Session of the International Research Society and International College of Anaesthetists, Sept. 8-11, 1947, New York, N.Y.  
R. G. W.

## S U R G E R Y

—●—●—●—●—●—  
Edited by S. S. Peikoff, M.D.

### "Acute Non-Specific Mesenteric Lymphadenitis"

D. W. Penner

Review of the literature and texts devotes a varied amount of space to the alleged entity of acute non-specific mesenteric lymphadenitis. The best exposition I have seen on this subject is by Aird (B. M. J., 1: 680, 1945). Much written on this subject is so poorly documented that it is valueless. Most of the authors agree that there is a clinical syndrome seen in children which often closely simulates an attack of acute appendicitis, but which at operation shows a normal appendix and "inflamed mesenteric lymph nodes." The etiology of this condition is unknown but many suggest it may be a virus.

#### Mesenteric Lymph Nodes in Normal Children

In none of the publications, except the textbook, Gastroenterology by Bockus, is any mention made of the normal anatomy of lymphoid tissue in children. Bockus merely mentions that the size of the nodes vary. Prior to puberty lymphoid tissue

in all body sites is abundant; this gradually atrophies. Normally mesenteric lymph nodes in the adult are both difficult to see or to find. In children the reverse is true. In our material all children coming to autopsy in cases of sudden accidental death show prominent mesenteric lymph nodes. Numerous nodes measuring up to 1.3 cms. are not unusual, especially in the mesentery of the lower ileum. Occasionally one encounters groups of nodes lying so closely together between the leaves of the mesentery that they appear to be one large node. Groups of such nodes having a total diameter up to 2.5 cms. have been seen. Since this mass of nodes is enclosed in a capsule, until sectioned, they form a fairly firm nodule, greyish to pink in color. On section their true structure is revealed. Microscopic examination of these nodes shows nothing of note; occasionally some sinus hyperplasia is seen. In a recent case an emergency operation was performed within three hours following an accident and the surgeon noted "mesenteric adenitis." The child died one and one-half hours later. At autopsy multiple lymph nodes up to 2 cms. in diameter were found

in the mesentery. The child gave no antecedent history of any illness. The nodes were considered normal by the pathologist.

### Non-Neoplastic Disease of Lymph Nodes in Childhood

(a) Secondary to Gastro-Intestinal Inflammation: The obvious inflammatory involvement of lymph nodes secondary to acute and chronic gastro-enteritis, both specific (as typhoid and tuberculosis) and non-specific, needs no further comment. We have seen a case diagnosed as acute mesenteric adenitis with a normal appendix removed. On finding pus in the lumen of the appendix it was suggested that the patient had an entero-colitis. Re-examination of the history of the attack of "appendicitis" revealed that the patient, several days prior to operation, had crampy abdominal pain with some diarrhea. This case would suggest that the enlargement of the nodes (no biopsy of nodes was taken) was secondary to bowel inflammation.

(b) Associated with Generalized Lymphoid Tissue Reaction: It is well recognized that diseases such as measles, diphtheria, infectious mononucleosis, etc., are associated with generalized, often painful, enlargement of the lymph nodes. Usually the enlargement is general but not always so and it is not uncommon to operate for an "acute appendix" in the pre-rash stage of measles. In measles and in infectious mononucleosis the histopathology of the lymph node is characteristic.

### Discussion

The most generally accepted concept is that acute lymphadenitis is always a secondary phenomenon. Even in the generalized reactions seen in the secondary stages of syphilis, measles, etc., it is probably a secondary effect. When specifically referring to mesenteric lymphadenitis it would seem more logical to consider this secondary to a mild enteritis (which is not easily proven clinically) than to assume that it is a clinical entity per se.

The writer is thoroughly convinced after observing cases in a large general hospital for a number of years that most of the diagnoses made of acute non-specific mesenteric lymphadenitis do not stand up to the most elementary criticism. In only a few instances have the lymph nodes been removed for histologic examination when this diagnosis is made in the operating room. None of these nodes have shown an acute inflammation. As a matter of fact they have all been considered normal.

Certainly one would not deny that a clinical condition described under the heading of acute non-specific mesenteric lymphadenitis does occur. We would suggest, however, that in all instances this is a secondary manifestation and that in the interest of accurate diagnosis should not be called

acute mesenteric lymphadenitis. We would go still further and suggest that on the basis of the literature and our own experience most diagnoses now made of acute non-specific mesenteric lymphadenitis are in the same category as the diagnosis of acute appendicitis when the pathologist on serial section of the appendix is unable to detect any evidence of inflammation. It is only by not binding ourselves to inaccurate terms and diagnoses that we leave the way open for further investigation into the many unanswered problems of disease processes.

### References

- Aird, I. (1945); B.M.J. I: 680.
- Babcock, W. W. (1946): Principles and Practice of Surgery 1st ed., Lea and Febiger, Philadelphia.
- Baker, A. H., James U. (1946): Lancet, 11: 232.
- Bockus, H. L. (1943): Gastro-Enterology, W. B. Saunders Co. Philadelphia.
- Brennemann (1921): Amer. J. Dis. Child., 22: 493.
- Cole, W. H., Elman R. (1941): Textbook of General Surgery 3rd ed., D. Appleton-Century, New York.
- Coleman, E. P. (1946): Amer. J. Surg., 11: 879.
- Klass, Alan A. (1949): Man. Med. Review, 29: 183-186.
- Maingot, R. (1936): Post Graduate Surgery, 1st ed., Vol. 1 Medical Publications, London.
- Miles, A., Wilkie D. (1939): Manual of Surgery, 9th ed., Humphrey Milford, London.
- Nelson, W. E. (1947): Textbook of Pediatrics, 4th ed., W. B. Saunders Co., Philadelphia.
- Price, F. W. (1947): A Textbook of the Practice of Medicine 7th ed., Humphrey Milford, London.
- Reader, N. L. M. (1945): B.M.J., 1: 818.
- Romanis, W. H. C., Mitchiner, P. H. (1948): The Science and Practice of Surgery, 8th ed., J. A. Churchill, London.
- Steele, G. H. (1945): B.M.J., 1: 861.
- Vuori, E. E. (1945): Acta Chir. Scandinav., XCII, 231.



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## EDITORIAL

J. C. Hossack, M.D., C.M. (Man.), Editor

### The New Graduates

This is a "Students' Number." Most of the contributors are students, whose work deserves commendation. The Editor of the University of Manitoba Medical Journal has contributed a guest editorial which you should read and think about.

To the new graduates we offer our congratulations on their entry into active co-operation with us. To be sure, they have already been of help to their elders. As students, they have inspired and encouraged and, more than they think, instructed those of us who have had the honour and privilege and responsibility of teaching them. As internes, they often had no little hand in assisting their seniors to bring back health to the sick. For seven years they have been learning the alphabet of, and some few phrases in, the language of disease. Now they are equipped to learn to read more fluently the message of sickness as it is written upon their patients and to learn to write with pen and scalpel the prescription cure.

They are very fortunate, these youths and maidens who now stand within our circle. They have learned so much and can do so much. Indeed, so many things have been crammed into their heads that it is little wonder that a good deal has spilled over. In fact, they have forgotten more than the ancient masters ever knew, but they remember more that is useful than all the masters of even half a century ago.

Now they stand facing the world with their hearts filled with hope and with their eyes fixed upon their Delectable Mountains even as it was with us their seniors. In contour and colour these mountains differ for each one but none can reach them without the help of guides. You will, perhaps, recall the names of the guides who led Christian to his Delectable Mountains—Knowledge, Experience, Watchful and Sincere. With Knowledge our young friends are on excellent terms and to Experience they have at least been introduced. Very valuable guides are these two, especially Experience for he fortifies Knowledge and grows increasingly in usefulness over the years. But Watchful must be of the company. He is the real instructor, for if he be absent Knowledge may lead one astray and Experience may lose his virtue. Therefore one must cling to Watchful if he would escape the briars of false doctrines and the pitfalls of deceptive evidence. But we must also hold firmly to Sincere for Knowledge and Experience and careful observation are helpful to knaves as well as to honest men and in our chosen work we can have nothing to do with knaves.

It is customary to regard graduation as an end whereas it is really a beginning. Our salutation should not be "ave atque vale," hail and farewell, but "vale atque ave," farewell and hail. For it is only to the short years of early apprenticeship that we bid farewell and it is the long partnership of the future that we hail.

This is the time, when students should swear that ancient oath which we call the Oath of Hippocrates, but which in spirit, perhaps even in language, was old when Hippocrates was young. We should swear or reswear it together, those who are new-born into the profession, and those who are growing or have grown old in it, on this happy but solemn occasion. We were in the past and still are a priesthood, a brotherhood. Let us renew our vows with those now taking them. The honour of our ancient calling lies in the hands of each one of us; let us keep it unsullied. Let us live and act as we have sworn to do. And when we repeat "My colleagues will be my brothers" let no one say that these are mere empty words but let us prove by our daily conducts the strength and the spirit of our fellowship.

And so, to you, our younger brothers and sisters, welcome into our body. You have an honourable tradition to uphold and in your hands lies the progress of the future. The job you are about to tackle is difficult but eminently satisfying. It's the best job in the world; good luck in it.

### Diagnostic Facilities

There is a questionnaire before us upon the subject of Diagnostic Clinics. Everyone will agree that the present diagnostic facilities in the City are even more than adequate. Whether or not the means of the citizens are sufficiently adequate to permit them to enjoy these facilities is another question. A shopful of bread does not help the hungry who are also poor; and there are many citizens who need but cannot easily afford diagnostic services. These could, of course, plead their poverty either at a hospital or in a doctor's office. But many cannot bring themselves to do this. Some prove by the event that they would rather die than accept charity. Some who live on small incomes or small pensions postpone the seeking of advice until they are almost or quite beyond help. The means for their assistance are there but the wherewithal to obtain that assistance is lacking.

To be sure there is the Manitoba Hospital Service but its members are not covered for diagnostic

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investigation. Members of the Manitoba Medical Service are excluded from benefits in the case of pre-existing conditions. A worker is protected only while he is working. Insurance policies are tricky things which often are valueless when illness strikes. It is apparent, then, that very many people have no protection, that many have only partial protection and that only a small percentage have complete protection.

Now we don't want Governments of any sort intruding between us and our patients. Yet it is difficult to see how all the people can enjoy all the benefits of modern medicine without governmental help. The people have become exceedingly conscious of modern medical methods and will demand their universal application. Governments, moreover, seeing the great popularity that follows "free medicine" will promise and even implement their promises of "free" medical care for all.

Every person who gives the matter any thought knows that there is no such thing as "free" medical care. But there can be inexpensive medical care and it is our duty to devise ways of making sickness a tolerable burden. Moreover we must be consistent. Spread all over the Province are posters urging people to seek medical advice early lest they be harbouring cancer in a treatable stage. But the person who follows this advice must foot his own bill which, under the circumstances, is likely to be high. The National Health Scheme in Great Britain is proving costly. Granted there is a lot of waste but it is not impossible that there is truth in Mr. Bevan's statement that the line-

ups at doctors consulting rooms is a proof of how much the British needed medical care. Unless the doctors' waiting rooms have become, like the iatria of Ancient Greece, mere places for the exchange of gossip, unless that is so the majority of those who attend are in need of care.

But undoubtedly getting something for nothing has its charms for some. It is far better to charge a little and give as much as is required than charge nothing (directly) and give less than is needed. Moreover the payment of a small fee quietens the scruples of those who want to feel independent. Therefore, so far as diagnostic facilities are concerned, they should be available to everyone without their use causing financial embarrassment. By far the best way to accomplish this is to widen the M.M.S. so that everyone can become a member. Governments would spend less money more wisely if they were to assist this Service by paying for indigents and by partially paying for those living on small pensions.

Let me remind you of certain Principles of Social Security adopted by the General Assembly of the World Medical Association at Geneva. "II, No intervention of third party between doctor and patient. III, Where medical service is submitted to control, this control should be exercised by physicians. VIII, It is not in the public interest that physicians should be full time salaried servants of the government or social security bodies."

Our diagnostic facilities are adequate. Now we must see to it that everyone will find his means adequate to enjoy them.

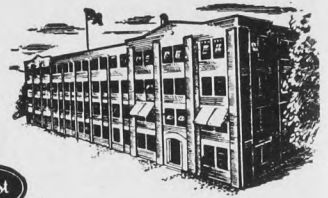
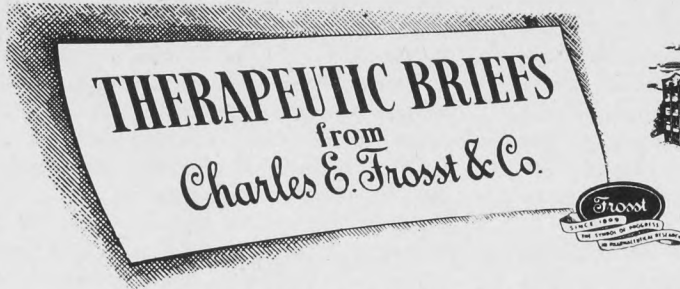
## Medico-Historical

J. C. Hossack, M.D., C.M. (Man.)

On the 6th of May, 1782, a remarkable series of experiments was commenced, in his private laboratory at Guildford, by James Price, a distinguished amateur chemist, and Fellow of the Royal Society. Mr. Price, during the preceding year, imagined he had succeeded in compounding a powder, capable, under certain circumstances, of converting mercury and other inferior metals into gold and silver. He hesitated before making public this extraordinary discovery; but having communicated it to a few friends, and the matter becoming a subject of doubtful discussion among chemists, he determined to put it beyond cavil, by conducting a series of experiments in presence of a select assemblage of men of rank, science, and public character. The experiments, seven in number, commenced, as already observed, on the 6th of May, and ended on the twenty-fifth of the same month. They were witnessed by peers, baronets, clergymen, lawyers, and chemists, and in all of

them gold and silver, in greater or less quantities, were apparently produced from mercury: to use the language of the alchemists, mercury was transmuted into gold and silver. Some of the gold thus produced was presented to the reigning monarch, George III, who received it with gracious condescension. The University of Oxford, where Price had been a fellow-commoner of Oriel College, bestowed on him the degree of M.D.; and his work, containing an account of the experiments, ran through two editions in the course of a few months.

The more sanguine and less scientific of the community saw in this work the approach of an era of prosperity for England such as the world had never previously witnessed. Who could doubt it? Had not the king honoured, and Oxford rewarded, the fortunate discoverer? Some, on the other hand, asserted that Price was merely a clever juggler; while others attempted to show in what manner he had deceived himself. On some points, however,



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The treatment of urinary tract infections often presents a difficult problem. The selection of the therapeutic agent can be a matter of fine discrimination, and depends largely on the nature of the infecting organism. In a recent study (1) of 200 cases of urinary tract infection, the following organisms, and their frequency, were found:

No. of Patients	Infecting Organism	Per cent
104	Escherichia coli - - - - -	52.0
28	Staphylococcus aureus - - - - -	14.0
23	Mixed staphylococcus & Escherichia coli	11.5
5	Staphylococcus albus - - - - -	2.5
8	Streptococcus - - - - -	4.0
10	Aerobacter aerogenes - - - - -	5.0
5	B. proteus - - - - -	2.5
9	No growth - - - - -	4.5
6	Gram-positive - - - - -	3.0
1	Streptothrix - - - - -	0.5
1	Pleomorphic - - - - -	0.5

It is thus apparent that in 52% of the cases E. coli was the infecting organism, while in another 25.5% staphylococcus aureus or a mixture of E. coli and S. aureus was found. The balance was made up of a few cases, each infected with the organism indicated.

There are now available a number of urinary antiseptics from which may be selected that preparation which is likely to prove most effective for each particular infection. These include penicillin, streptomycin, sulphonamides, mandelic acid, hexamine and certain dyes.

It is to be noted that over 75% of the urinary tract infections are due to E. coli, or to a mixture of E. coli and S. aureus. For this group it has been found that a combination of mandelic acid and hexamine will clear over 70% of cases after a few days.

A particularly useful formula is that of "Uromand".

Calcium mandelate - - - 5 gr. (0.32 G.)  
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When this formula is administered in adequate dosage, the pH. of the urine reaches 5.0 to 5.3, at which level, especially in the presence of "Urosine", many pathogenic organisms are unable to flourish and the urinary tract becomes sterile.



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**UNTOWARD EFFECTS:** Administration of "Uromand" is safe and only rarely is it not tolerated. In a few instances, nausea and burning on micturition may be noted and call for reduction of the dose.

#### REFERENCE

(1) Carroll and Allen,  
Journ. of Urology, 55, 675, 1946.

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there could be no difference of opinion. Unlike many professors of alchemy, Price was not a needy, nameless adventurer, but a man of wealth, family, and corresponding position in society. As a scientific man, he had already distinguished himself in chemistry, the study of which he pursued from a pure love of science; and in private life his amiability of character had insured many worthy and influential friends.

In the fierce paper conflict that ensued on the publication of the experiments, the Royal Society felt bound to interfere; and, accordingly, called upon Price, as a fellow of the society, to prove, to the satisfaction of his brother fellows, the truth of his alleged transmutations, by repeating his experiments in their presence. From this point Price seems to have lost confidence, and decided symptoms of equivocation and evasion appear in his conduct. He declined to repeat his experiments, on the grounds that the process of preparing the powder of projection was difficult, tedious, and injurious to health. Moreover, that the result of the experiments, though most valuable as a scientific fact, was not of the profitable character he at first believed and the public still supposed; the cost of making gold in this manner being equal to, in some instances more than, the value of the gold obtained; so much, so indeed, that by one experiment it cost about seventeen pounds sterling to make only one ounce of gold, which, in itself, was not of the value of four pounds. These excuses were taken for what they were worth; Sir Joseph Banks, the president of the society, reminding Price that not only his own honour, but the honour of the first scientific body in the world, was implicated in the affair. Price replied that the experiments had already been conducted in the presence of honourable and competent witnesses, and no advantage whatever could be gained by repeating them—"for as the spectators of a fact must always be less believed, if they believe at all, on the credit of attestation." Further, he adduced his case as an example of the evil treatment that has ever been the reward of great discoverers; and concluded by asserting that his wealth, position in society, and reputation as a scientific chemist, ought, in unenvious and unprejudiced minds, to free him from the slightest suspicion of deceit. To Price's friends this line of conduct was painfully distressing. Yielding at last to their urgent entreaties, he consented to make some more powder of projection, and satisfy the Royal Society. For this purpose, as he stated, he left London in January, 1783, for his laboratory at Guildford,

faithfully promising to return in a month, and confound, as well as convince, all his opponents.

Arriving at Guildford, Price shut himself up in his laboratory, where he made it his first employment to distil a quantity of laurel-water, the quickest and deadliest poison then known. He next wrote his will, commencing thus—"Believing that I am on the point of departing from this world." After these ominous preliminaries, he commenced the preparation of his promised powder of projection. One, two, three—six months passed, but nothing being heard from Price, even his most attached friends reluctantly confessed he had deceived them, when, to the surprise of every one, he reappeared in London, and formally invited as many members of the Royal Society as could make it convenient to attend, to meet him in his laboratory at Guildford on the 3rd of August. Although, scarcely a year previous, the first men in England were contending for the honour of witnessing the great chemist's marvellous experiments, such was the change in public estimation caused by his equivocal conduct, that, on the appointed day, three members only of the Royal Society arrived at the laboratory, in acceptance of his invitation. Price received them with cordiality, though he seemed to feel acutely the want of confidence implied by their being so few. Stepping to one side for a moment, he hastily swallowed the contents of a flask of laurel-water. The visitors, seeing a sudden change in his appearance, though then ignorant of the cause, called for medical assistance; but in a few moments the unfortunate man was dead. Many and various were the speculations hazarded on this strange affair. It is most probable that Price had in the first instance deceived himself, and then, by natural sequence, attempted either wilfully or in ignorance to deceive others, and, subsequently discovering his error, had not the moral courage to confess openly and boldly that he had been mistaken.

The Last of the Alchemists.

Chambers.

## Obituary

### Dr. Elizabeth Steele

Dr. Elizabeth Steele died at her home in Winnipeg on March 17, after a long illness. In the First World War she served overseas as a nurse, then graduated in medicine from the University of Manitoba in 1935. She practised in paediatrics in Winnipeg. Her husband and son survive her.

44...

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## SEDATIVE

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Coronary disease<sup>1</sup>  
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Decompensation  
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Hyperthyroid  
Menopause—female, male

## Nausea and Vomiting

Functional or organic disease (acute gastrointestinal and emotional)  
X-ray sickness  
Pregnancy  
Motion sickness

## Gastrointestinal Disorders

Cardiospasm<sup>2</sup>  
Pylorospasm<sup>2</sup>  
Spasm of biliary tract<sup>2</sup>  
Spasm of colon<sup>2</sup>  
Peptic ulcer<sup>2</sup>  
Colitis<sup>2</sup>  
Biliary dyskinesia

## Allergic Disorders

Irritability  
To combat stimulation of  
ephedrine alone, etc.<sup>3,1</sup>

## Irritability Associated

With Infections<sup>4</sup>

Restlessness and Irritability  
With Pain<sup>5,4</sup>

## Central Nervous System

Paralysis agitans  
Chorea  
Hysteria  
Delirium tremens  
Mania

## Anticonvulsant

Traumatic  
Tetanus  
Strychnine  
Eclampsia  
Status epilepticus  
Anesthesia

## HYPNOTIC

Induction of Sleep

## OBSTETRICAL

Nausea and Vomiting  
Eclampsia  
Amnesia and Analgesia<sup>6</sup>

## SURGICAL

Preoperative Sedation  
Basal Anesthesia  
Postoperative Sedation

## PEDIATRIC

Sedation for.  
Special examinations  
Blood transfusions  
Administration of parenteral fluids  
Reactions to immunization procedures  
Minor surgery

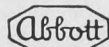
## Preoperative Sedation

Nembutal alone or  
<sup>1</sup>Glucophylline and Nembutal,  
<sup>2</sup>Nembutal and Belladonna,  
<sup>3</sup>Ephedrine and Nembutal,  
<sup>4</sup>Nembudeine,  
<sup>5</sup>Nembutal and Acetylsalicylic Acid  
<sup>6</sup>with scopolamine or other drugs.



## satisfying a wide variety of needs

That, too, is the function of short-acting Nembutal—satisfying a wide variety of needs. With over 470 papers already published on the clinical uses of short-acting Nembutal, more than 44 conditions have been reported in which it has been effectively employed. As a result, more and more physicians are seeing new opportunities for its use. They have learned that adjusted doses of Nembutal make possible any degree of cerebral depression from mild sedation to deep hypnosis. Short-acting Nembutal requires only about *one-half* the dosage of many other barbiturates. With small dosage, there is less drug to be inactivated, less possibility of “hangover,” shorter duration of effect, wide margin of safety. Eleven Nembutal products—all in convenient small-dosage forms—are available at your pharmacy. Write for the comprehensive new booklet, “44 Clinical Uses for Nembutal.” ABBOTT LABORATORIES LTD., Montreal.



in equal oral doses, no other barbiturate combines  
**QUICKER, BRIEFER, MORE PROFOUND EFFECT**  
**than . . . . .**

# Nembutal

TRADE MARK REG'D.

(PENTOBARBITAL, ABBOTT)

## Winnipeg Medical Society—Notice Board

Reported by L. R. Coke, M.D.

R. A. Macpherson, *President*

T. E. Holland, *Vice-President*

**Next Meeting**

**Friday, May 20th**

S. A. Boyd, *Treasurer*

K. R. Trueman, *Secretary*



At the meeting of the Winnipeg Medical Society on the eighteenth of March, Dr. N. P. Merkeley's paper on hand injuries was splendidly illustrated with coloured slides and Dr. A. Gibson showed a very fine coloured moving picture depicting both operative and post-operative treatment of cases of osteo-arthritis of the hip-joint. Dr. Merkeley said that infection, slow healing and excessive scar formation were related processes and resulted in loss of function. Early closure of wounds with asepsis and the use of full thickness grafts were the important principles of treatment. Function rather than aesthetic effect was the surgeon's aim. A hand was shown from which the fingers had been lost to which a toe had been grafted. Good opposition with the thumb was obtained.

Dr. Gibson reviewed the results in one hundred cases of Arthritis of the hip-joint treated with vitallium cup. Dr. Gibson uses his own modification of the Kocher approach to the hip joint. Relief of pain was obtained in seventy-five per cent of cases. Some excellent results were obtained in instances where there was good co-operation in muscle training post-operatively.

Dr. J. D. Adamson made "TIME" on the fourteenth of March by his visit to Chesterfield Inlet. An account of the expedition was given at the Winnipeg Medical Society Meeting on the eighth of April.

Not the coldest, but the chilliest part of the continent, is the area between Chesterfield Inlet, Eskimo Point and Baker Lake. The photographs shown by Dr. W. J. Wood might have given Al Capp inspiration for his Lower Slobbovia.

Other epidemics of Poliomyelitis have been described amongst Eskimos in the winter in Greenland. The cases occurring recently could all be traced to earlier cases in Churchill, Manitoba, and followed the movements of an Eskimo called Tootoo who travelled from Churchill to Chesterfield Inlet, Eskimo Point and Baker Lake. In an area populated by about three hundred people there have been seventy-five cases of Poliomyelitis with thirteen deaths. The case histories were typical with a prodromal illness characterized by headache, anorexia, vomiting and fever. The prodromal phase lasted two or three days. The patient seemed to have recovered. On the seventh or eighth day muscle pains and paralysis appeared. More than half of the non-fatal cases had paralysis. Cell counts up to two hundred and fifty were obtained, though some with high counts have since made a good recovery. A high C.S.F. protein seems to indicate a bad prognosis. A post mortem done on one case shortly after death showed typical anterior horn cell changes worse in the Lumbar Region. Disease with paralysis has been transmitted to macacus rhesus monkeys. Thirteen cases were flown out to the King George Hospital and progress reports were given by Dr. J. L. Downey.

At the same meeting Dr. I. O. Fryer and Dr. Atholl Gordon discussed the problems of Coroners and the need for more extensive training for physicians entering this field.

The Annual Meeting and Election of Officers will be held on the twentieth of May in Theatre "A" at the Medical College.

## CLINICAL LUNCHEONS

Clinical Luncheons during this month will be held as follows:

Tuesday, May 3rd—King Edward Hospital.

Thursday, May 5th—Winnipeg General Hospital.

Friday, May 6th—Children's Hospital.

Tuesday, May 10th—Misericordia Hospital.

Thursday, May 12th—St. Boniface Hospital.

Friday, May 13th—Victoria Hospital.

Tuesday, May 17th—Grace Hospital.

Thursday, May 19th—Winnipeg General Hospital.

Tuesday, May 24th—St. Joseph's Hospital.

Wednesday, May 25th—Deer Lodge Hospital.

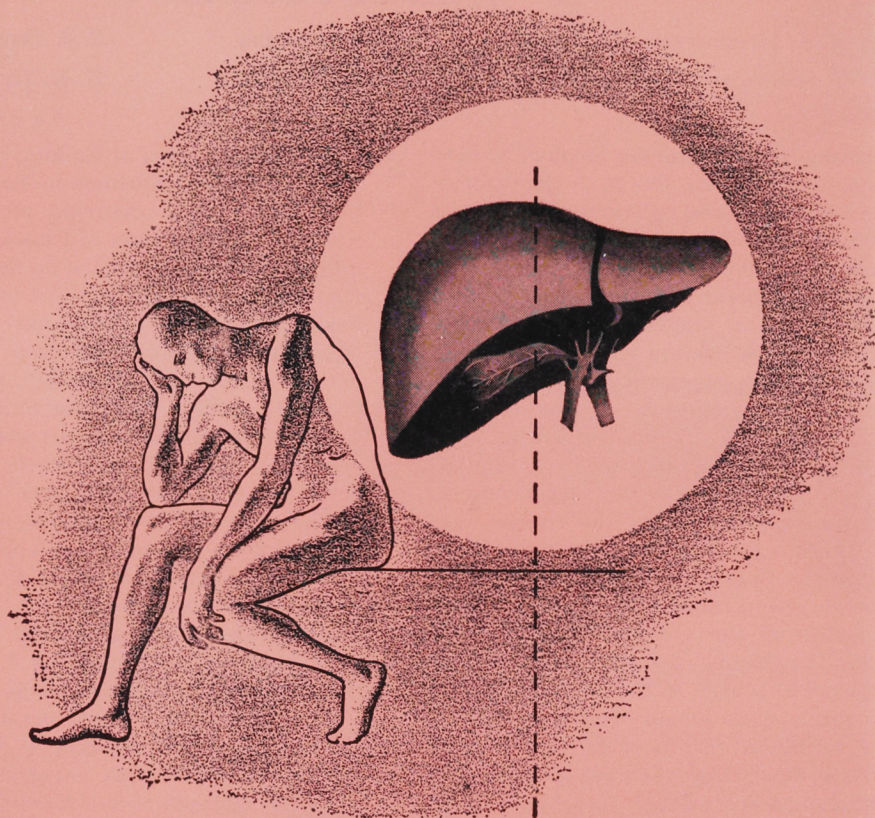
D.V.A., Evening.

Thursday, April 26th—St. Boniface Hospital.

General Ward Rounds are held at the Municipal Hospital at 8.30 a.m. each Friday, and at the Children's Hospital at 11.00 a.m. each Thursday.

Tumor Clinics are held at 9.00 o'clock each Wednesday morning at Winnipeg General Hospital, and at 10.00 o'clock each Friday morning at St. Boniface Hospital.

The regular meeting time of the Winnipeg Medical Society is the third Friday, May 20th.



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- ... supplies the only specific essential factor which prevents and repairs liver injury.
- ... is immediately available for liver repair, whereas methionine mixed with other protein fractions is subject to utilization elsewhere.
- ... is completely nontoxic (as opposed to cystine).
- ... is convenient to administer, replacing other measures which are often inadequate, costly and inconvenient.

*Bottles of 100 half-gram tablets.*

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## SOCIAL NEWS

Reported by K. Borthwick-Leslie, M.D.

Though the picture is rather a grim one, it is pleasant to see our old friend, Colonel Lennox Arthur, smiling at us. He is retiring from his post as administrative assistant of Medicine at Vancouver General Hospital.

Dr. Ethel Bookhalter, ex-Capt., R.C.A.M.C., is at present holidaying with her family in Winnipeg during an interim period of her post graduate pediatric course in New York City, New York.

Mrs. Richard Yoholnitsky and daughter have returned from Edinburgh, where they visited Dr. Yoholnitsky, who is studying at the Royal College of Physicians and Surgeons. She and her sister, Mrs. Michael Yoholnitsky, will leave shortly for their home in Yorkton, where Dr. Michael Yoholnitsky is located.

Dr. and Mrs. D. C. Aikenhead left recently for a prolonged trip to England and Scotland where they will visit Dr. and Mrs. Dave, Junior.

Dr. and Mrs. H. D. Kitchen have returned from their vacation in Bermuda and New York. When in New York Dr. Kitchen attended the meeting of the American College of Physicians.

Dr. Donna Huggins is also back from Washington where she attended the Anaestheologists' meeting.

Congratulations to Dr. Harold Blondal, who has been awarded a fellowship in research. Harold and Pat will be moving off to Chalk River during the summer. We will miss them, but good luck, kids.

The final meeting of the year of the Manitoba Medical Women will be in honor of the girls graduating this year. The place—Dr. Jessie McGeachy's home—the time—Sunday, May 15th, at 6 p.m. Buffet supper. Election of officers, lady confreres please note.

Mr. and Mrs. Frank Green announce the engagement of their daughter, Marjorie, to F/L John Alan Anderson, D.S.O., D.F.C., C.deG., youngest son of Mrs. Anderson and the late Dr. Brodie Anderson. The wedding will take place April 29th in Kildonan United Church.

Dr. and Mrs. Vernon Paul (nee Sally Gyles), announce the birth of twin boys at San Fernando, Trinidad.

Dr. Sam McMorris passed through town last week en route to Ottawa and on to Moscow, where he will be attached to the Canadian Embassy. He has been located in Pincher Creek, Alberta, and reports Drs. Rhonda and Lorne Collins to be happy re the arrival of another baby girl. It looks as though Lorne might make good his boast or threat (?) of raising a baseball nine. Now it would seem to be a softball nine!!

Dr. and Mrs. Irvin O. Fryer announce the engagement of their daughter, Ruth Hilda, to Roderrick Harold, son of Mr. and Mrs. H. Drysdale. The wedding is to take place May 9th in Young United Church.

Thanks to the hospitality of Dr. and Mrs. Jack McKenty, those of us in town were able to renew friendship with our classmate, Dr. Jo Bloomer, of Maryville, Missouri. Jo looks very healthy, happy and prosperous.

Notice—Found—in the Faculty Room of the Royal Alex. at the Medical Grads Farewell—one diamond ring. Will the owner please call 42 111 or my office, 923 996.

Congratulations to Mr. and Mrs. Murray Campbell on the arrival, April 8th, of Bonnie Evelyn—proud grandparents are Dr. and Mrs. W. E. Campbell.

Dr. and Mrs. W. A. Carter, of Red Deer, Alta., announce the arrival of Dale Christine, April 7th.

Dr. and Mrs. R. B. Ketcheson, Yorkton, Sask., announce the birth of Dale Louise, April 6th.

Dr. and Mrs. Louis Bernard, of Montreal, formerly of Winnipeg, sailed from New York, to spend the next few months visiting the continent. Mrs. Bernard was Miss Rene Bourgouin, of Winnipeg.

Sincere sympathy to the family and friends of Dr. Leon Benoit, well known pioneer physician of St. Boniface, who died recently following a lengthy illness.

Dr. W. B. McKinnon left on March 20th for New York where he will sail aboard the Queen Elizabeth to spend two months visiting British Orthopaedic hospitals.

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in penicillin therapy

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*Parke-Davis*

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**REPOSITORY** PENICILLIN



## higher initial levels

A 1-cc. intramuscular injection produces serum levels of 4.0 units per cc.—a value 133 times higher than the commonly accepted therapeutic level, 0.03 units per cc.

## quicker maximal therapeutic levels

Within a half hour or less after the injection, a high concentration of penicillin is found in the tissues.

## prolonged high maintenance levels

For twenty-four hours or longer, a single injection continues to provide effective therapeutic levels.

## better control of infection

Rapid onset and prolonged maintenance of higher levels means more effective antibacterial action than possible with penicillin in retardant vehicles.

## extra margin of effectiveness

Higher levels quickly obtained permit early dominance over infecting organisms and diminish likelihood of penicillin-fastness.

## ease of flow

Penicillin S-R contains no oil, no wax, no added suspending or dispersing agents to impede injection or clog needle and syringe.

### additional advantages of **PENICILLIN S-R**

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Aqueous diluent  
No vigorous shaking

#### ADMINISTRATION:

Free-flowing  
Quickly injected  
No special-type syringe

#### CONVENIENCE:

Syringe and needle need not be dry  
No plugging of needles (20 or 21 gage)  
Syringe and needles easily cleaned

#### TOLERANCE:

No sensitizing diluents  
No added suspending agents  
Completely absorbed  
Minimal pain

PENICILLIN S-R is supplied in both one-dose (400,000 units) and five-dose rubber-diaphragm-capped vials. When diluted according to directions (with Water for Injection, Normal Saline Solution, or 5 per cent Dextrose Injection), each cc. contains 300,000 units of crystalline procaine penicillin-G and 100,000 units of buffered crystalline sodium penicillin-G. The one-dose vial is also available with an accompanying ampoule of Water for Injection, if desired. Potency of the suspension is maintained for seven days at refrigerator temperatures.

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# COLLEGE OF PHYSICIANS AND SURGEONS OF MANITOBA

M. T. Macfarland, M.D., Registrar

(Continued from April, 1949, Issue)

Most of the morning session was taken up with the Education Committee's meeting to which I was kindly invited and in the afternoon session Dr. H. H. Hepburn, of Alberta, Chairman of this committee, presented his report. The burden of their report dealt with the holding of coincidental 5th year and L.M.C.C. exams. These are optional with any school wishing to adopt the practice and if the necessary arrangements in timing, etc., can be made. Considerable discussion centred about the feasibility of some uniform method of handling applications from non-Canadian and non-British citizens for enabling certificates to write the L.M.C.C. It was proposed that a Committee be struck by the incoming chairman, Dr. Noble, of Toronto, to study ways and means. However, it was generally agreed that it was up to each Provincial Council duly to pass on the merits and qualifications of each applicant and that the Medical Council of Canada per se had no authority directly to receive and accept such applications. It appeared that the other Councils across Canada are having as much head pain over these gigantic files of foreign applicants as our own registration Committee.

Dr. Poole brought up the matter of minutes regarding the case of Dr. \_\_\_\_\_, but I must confess that the minute regarding reinstatement if accepted by Manitoba College of Physicians and Surgeons looked as if it had been inserted **after** the meeting.

Dr. B. D. Best was appointed a member of the Discipline Committee of the Medical Council of Canada. L.M.C.C. exams to be held May 5, 1949.

All of which is respectfully submitted,

Brian D. Best.

**Motion:** "THAT the report of the representatives to the Medical Council of Canada be adopted." Carried.

## F. Representative to the University Senate

As your representative to the Senate of the University of Manitoba I have attended the ten meetings of that body since my appointment at our last annual meeting.

I have also attended all meetings of the Senate's Committee for the Administration of the Basic Sciences Act.

During this period, Basic Sciences Certificates have been issued to 118 medical graduates. 56 of these are from the University of Manitoba, 17 from other parts of Canada, 22 from Great Britain, 2 from Australia, 16 from U.S.A., 3 from continental Europe, 1 each from Madras and China.

One non-medical applicant was required to take

examinations in the subjects named in the Basic Sciences Act and has failed in all of these.

The Regulations under which the Basic Sciences Act operates were amended in May, 1948, in such a manner as to facilitate the issuance of Certificates under the Act by the University.

Respectfully submitted,

J. M. Lederman.

**Motion:** "THAT the report of the representative to the University Senate be adopted." Carried.

## G. Representatives to the Cancer Institute

I would draw to your attention that the Registrar of the College of Physicians and Surgeons is an ex-officio member of the Board of the Cancer Institute, and I assumed my position on the Board, replacing Dr. W. G. Campbell on his retirement.

I was greatly impressed by the degree of prestige with which Dr. Campbell is held by the whole Board of the Institute and by the very real regret that was felt by them upon the necessity of his retirement. It is very apparent that Dr. Campbell's advice has been invaluable to the Board in the past.

The activities of The Manitoba Cancer Institute are discussed at considerable length in their annual report, and I am tabling a copy with this report.

Dr. A. M. Goodwin, in his capacity as Chairman of the representatives of the Manitoba Medical Association to the Cancer Institute Board, has prepared additional information on the activities of the Cancer Institute. Accordingly there is little that I can add.

"During the past year the headquarters of the Cancer Institute have been moved into a larger building at 442 William Avenue, the old Normal School.

One of the major activities and one which is constantly expanding, is the Institute's programme of public education in the rural areas of the Province. This work is spearheaded at the various women's organizations throughout the rural areas and as many meetings as possible are arranged with these groups. Moving pictures are shown and the group addressed by a Public Health Nurse and wherever possible by the local physician. The staff of the Institute have expressed their gratification for the support they have received by the physicians in the rural areas. During the past year 470 different women's organizations co-operated with the Institute, which is a figure almost double that of five years ago.

Rural biopsy service has been extended and the demand for this service has increased nearly three fold in the last five years. The demand for both the X-ray and Radium services of the Institute

have steadily increased and the number of rural patients treated has approximately doubled in the same period.

Within the past year the cancer registration, patient follow-up and statistical service has been extended and this department is now studying the stages at which various conditions are diagnosed. At present there are 1,960 patients being followed in the follow-up service and 95.3% of these have up-to-date reports. This information permits, amongst other things, an analysis of the stage at which various types of cancer are being diagnosed.

During the year the Union of Municipalities has recommended to the Provincial Government that a prepaid diagnostic service be made available to the rural residents of the Province. A similar request has been made directly to the Institute by the Women's Institutes. The feasibility of such a plan is now under study by the Institute, but such a plan would require financial resources beyond the ability of the Institute to meet, and the ultimate decision for or against such a procedure would accordingly lie with the Provincial Government who would have to meet the cost. During the past summer the Dominion Government has made money available to the Provinces for the diagnosis and treatment of cancer, and presumably the Provincial Government will now formulate some policy in regard to such a service. Should the Government policy be in favour of the establishment of such a service, it is probable that the Cancer Institute will be asked to put it into force."

Respectfully submitted,

M. T. Macfarland.

**Motion:** "THAT the report of the representatives to the Cancer Institute be adopted." Carried.

## Election of Officers 1948-1949

### 6. Election of Officers and Standing Committees

#### Officers:

President—Dr. C. B. Stewart.  
Vice-President—Dr. Edward Johnson.  
Registrar—Dr. M. T. Macfarland.  
Treasurer—Dr. T. H. Williams.

#### Nomination Committee to Strike Standing Committees

The following members were appointed from the Chair, to be a Committee to strike Standing Committees: Drs. J. S. Poole, D. L. Scott and E. K. Cunningham.

Dr. W. F. Stevenson vacated the Chair in favour of the newly elected President, Dr. C. B. Stewart.

#### Standing Committees

Registration Committee—Dr. B. D. Best (Chairman), Dr. J. M. Lederman, Dr. H. Bruce Chown.

Education Committee—Dr. A. A. Alford (Chairman), Dr. I. Pearlman, Dr. E. K. Cunningham.

Finance Committee—Dr. T. H. Williams (Chairman), Dr. C. S. Crawford, Dr. D. L. Scott.

Legislative Committee—Dr. J. S. Poole (Chairman), Dr. E. K. Cunningham, Dr. J. Prendergast, Dr. F. K. Purdie, Dr. Edward Johnson.

Discipline Committee—Dr. A. A. Alford (Chairman), Dr. C. B. Stewart, Dr. C. W. Wiebe, Dr. J. Prendergast, Dr. H. Bruce Chown.

Executive Committee—Dr. B. D. Best (Chairman), Dr. W. F. Stevenson, Dr. J. S. Poole, Dr. I. Pearlman, Dr. J. M. Lederman.

Library Committee—Dr. H. Bruce Chown.

Taxing Committee—Dr. C. W. Wiebe (Chairman), Dr. F. A. Rybak, Dr. Edward Johnson.

**Motion:** "THAT the appointment of Standing Committees be accepted." Carried.

#### Election of Special Committees

Representatives to the Manitoba Medical Association Executive—Dr. C. B. Stewart and Dr. Edward Johnson.

Representatives to the Committee of Fifteen—Dr. B. D. Best, Dr. I. Pearlman and Dr. Edward Johnson.

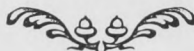
Representative to the Committee on Admissions—Dr. H. Bruce Chown.

Representative to the University Senate—Dr. J. M. Lederman.

Representatives to the Medical Council of Canada—Dr. J. S. Poole and Dr. B. D. Best.

#### Appointment of Auditors

**Motion:** "THAT Price, Waterhouse and Company be auditors for the College of Physicians and Surgeons of Manitoba for the year 1948-49." Carried.



## Department of Health and Public Welfare

### Comparisons Communicable Diseases — Manitoba (Whites and Indians)

DISEASES	1949		1948		Total	
	Feb. 27 to Mar. 26, '49	Jan. 30 to Feb. 27, '49	Feb. 22 to Mar. 20, '48	Jan. 25 to Feb. 21, '48	Jan. 2 to Mar. 26, '49	Dec. 28 to Mar. 20, '48
Anterior Poliomyelitis .....	0	0	2	0	0	2
Chickenpox .....	147	137	227	274	444	685
Diphtheria .....	1	6	2	1	9	5
Diphtheria Carriers .....	0	2	0	0	2	0
Dysentery—Amoebic .....	0	0	0	0	0	0
Dysentery—Bacillary .....	2	2	0	0	4	0
Erysipelas .....	5	1	1	1	9	5
Encephalitis .....	0	0	0	0	0	0
Influenza .....	27	10	14	3	42	18
Measles .....	828	711	21	43	1889	79
Measles—German .....	2	0	2	10	7	22
Meningococcal Meningitis .....	4	0	2	1	5	3
Mumps .....	221	152	183	195	521	488
Ophthalmia Neonatorum .....	0	0	0	0	0	0
Pneumonia—Lobar .....	28	11	17	12	44	36
Puerperal Fever .....	0	1	0	0	1	0
Scarlet Fever .....	6	14	10	8	36	29
Septic Sore Throat .....	5	4	5	1	9	6
Smallpox .....	0	0	0	0	0	0
Tetanus .....	0	0	0	0	0	0
Trachoma .....	0	0	0	0	0	0
Tuberculosis .....	57	47	110	118	118	245
Typhoid Fever .....	3	0	0	1	3	1
Typhoid Paratyphoid .....	0	0	0	0	0	0
Typhoid Carriers .....	1	0	0	0	1	0
Undulant Fever .....	3	2	0	0	5	0
Whooping Cough .....	26	26	28	38	57	122
Gonorrhoea .....	106	96	111	115	299	317
Syphilis .....	42	35	40	48	114	126
Diarrhoea and Enteritis, under 1 yr.	16	8	11	4	29	21

For Four-Week Period February 27 to March 26, 1949

DISEASES	*743,000 Manitoba	906,000 Saskatchewan	3,825,000 Ontario	2,962,000 Minnesota
(White Cases Only)				
*Approximate population.				
Anterior Poliomyelitis .....	2	—	—	5
Chickenpox .....	147	147	2429	—
Diarrhoea and Enteritis .....	16	—	—	—
Diphtheria .....	1	—	3	7
Dysentery, Amoebic .....	—	—	—	1
Dysentery, Bacillary .....	2	—	1	—
Encephalitis .....	—	—	1	—
Infectious Jaundice .....	—	—	16	—
Influenza .....	27	36	211	5
Malaria .....	—	—	—	2
Measles .....	828	548	1312	437
Measles, German .....	2	576	207	—
Mumps .....	221	122	1467	—
Meningococcal Meningitis .....	4	—	7	4
Pneumonia Lobar .....	28	—	—	—
Septic Sore Throat .....	5	8	15	—
Scarlet Fever .....	6	8	452	208
Tuberculosis .....	57	27	90	177
Typhoid Fever .....	3	—	1	—
Typhoid Carrier .....	1	—	—	—
Undulant Fever .....	3	—	3	11
Whooping Cough .....	26	29	49	6
Gonorrhoea .....	106	—	185	—
Syphilis .....	42	—	155	—

## DEATHS FROM REPORTABLE DISEASES

For Four-Week Period February 23 to March 22, 1949

**Urban**—Cancer, 44; Influenza, 2; Pneumonia Lobar (108, 107, 109), 3; Pneumonia (other forms), 5; Syphilis, 1; Tuberculosis, 6; Diarrhoea and Enteritis, 2. Other deaths under 1 year, 21. Other deaths over 1 year, 202. Stillbirths, 13. Total, 236.

**Rural**—Cancer, 23; Influenza, 1; Lethargic Encephalitis, 1; Measles, 1; Pneumonia Lobar (108, 107, 109), 7; Pneumonia (other forms), 7; Syphilis, 2; Tuberculosis, 6; Hodgkin's Disease, 1; Diarrhoea and Enteritis, 1. Other deaths under 1 year, 11. Other deaths over 1 year, 154. Stillbirths, 6. Total, 171.

**Indians**—Pneumonia Lobar (108, 107, 109), 3; Pneumonia (other forms), 1; Tuberculosis, 1. Other deaths under 1 year, 3. Other deaths over 1 year, 2. Total, 5.



**Chickenpox, Measles and Mumps** are still quite prevalent and as yet show no signs of abating.

**Influenza**, although not reported in large numbers, has been epidemic in many parts of the province. Fortunately it has not been especially severe nor followed by serious complications.

**Typhoid Fever**—Two of the cases reported were Indian boys from the Sandy Bay Reserve, which has been a typhoid reservoir for several years. Their sanitation and personal hygiene makes it difficult to prevent typhoid among them. The other case was a laborer on a railroad section gang.

**Typhoid Carriers**—One was discovered in the city of Winnipeg.

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